

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 306. (No. 45, Vol. VI.)

NOVEMBER 6, 1914.

[Registered at the G.P.O.] [Weekly, Price 3d.
as a Newspaper. Post Free, 3½d.]

Flight.

Editorial Office: 44, ST. MARTIN'S LANE, LONDON, W.C.

Telegrams: Truditur, Westrand, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free.

United Kingdom ... 15s. od. Abroad ... 20s. od.

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EDITORIAL COMMENT.

The sinking of H.M.S. "Hermes" in the Straits of Dover on Saturday last as the result of being struck by a torpedo fired by one of the enemy's submarines, while officially regarded as being one of "small military significance," is one that has been received with great regret by all interested in aviation, and especially by everyone associated with the Royal Naval Air Service. The vessel, which was launched in 1898 and belonged to the "Highflyer" class, was of special interest to those connected with the flying movement by reason of the fact that it had for some time past played an important part in the development of the seaplane to its present state of reliability and practicability, and was also a familiar visitor to some of the air stations on the East Coast. Furthermore, at the time of the disaster it was taking its part as a seaplane dépôt ship with the fleet of war vessels that has, during the last fortnight, been assisting the army to break the advance of the Germans along the Belgian coast.

While the flying world has thus good reason to show

a sentimental interest in the loss of the vessel—and doubtless its disappearance will cause some temporary inconvenience to the Admiralty—yet the "Hermes" was not a ship that was looked upon or counted as one likely to take a prominent part in any naval action, and it is, of course, inevitable that in such a serious war as is now raging we must expect losses and reverses of this kind. On the other side of the balance sheet, we must not forget that, however humiliating to our pride the exploits of the German submarines may be, Great Britain has, on the whole, paid a trivial price for the command of the sea which our Navy has secured. Not only has it succeeded in bottling up the German Fleet, with the exception of a few vagrant cruisers, but it has swept the German mercantile fleet and commerce from the face of the waters, held open all the trade routes of the world not only for British ships but for all those of friendly and neutral countries, and made the transport of hundreds of thousands of British troops, and the necessary supplies, as safe as if there were no such thing as a war in being. In a word, the losses our Navy has suffered, regrettable as they are from the point of view of the loss of life they have entailed, are as nothing in comparison to the great work that has been accomplished.

There is one feature in connection with the loss of the "Hermes" on which there is cause for congratulation, and that is the relatively small loss of life that occurred. The vessel had a complement of about 450 officers and men, the greater part of whom were rescued, and safely landed. The exact loss has not yet been officially announced up to the time of writing, but, according to a Dover correspondent, it did not exceed forty, which is remarkably low in comparison with what was unfortunately experienced in the case of some of the other vessels we have lost. According to another report, the relatively small number of drowned was due to the brilliant idea of someone on board who evidently retained his presence of mind in face of death—that of using empty petrol tins as life-buoys. A supply of life-saving pneumatic collars ordered by the Admiralty had been expected, but the "Hermes" had to put to sea before these were received. When the vessel was torpedoed, and the fact that she was doomed was realised, someone thought of the 400 petrol tins that were on board. The order was promptly given to empty the tins and to screw down the stoppers, and by the aid of these tins scores of men, who must otherwise have been drowned, are said to have kept themselves afloat until they were rescued from their perilous position.

The Royal Aero Club and the War.

What with a large section of the Committee, the Chairman, the Vice-Chairman, the Secretary, and close upon two hundred and fifty of its members at present engaged in serving their country in one direction or another, there is just now a relatively quiet state of affairs prevailing at the home of the Royal Aero Club in Piccadilly. Although, while the war lasts, the quietude and relative inactivity of the Club may be expected to continue, there is little doubt that, once the great struggle of nations is terminated, the Club will enter on a period of considerable expansion for which it is to be hoped the Committee will be well prepared.

While the sporting side of aviation has hitherto been attractive to many of the members, yet, in the heart of things, it has long been realised that initially one of the main, if indeed not the sole purpose of aeroplanes would be in connection with naval and military operations. There have been times when without doubt Great Britain was not keeping pace with the great progress in aviation that was being made on the Continent. This was, fortunately, taken in hand before too late, and the brilliant success of British aircraft since the war commenced in both branches of the services has once again proved that, while Britain may be slow to move, when she does get a move on, it is one that puts us well in the forefront of things. And it is because of the prominent part the Royal Aero Club has played in this great work, that we look forward with confidence to it becoming one of the most popular and successful clubs in the great Metropolis.

Anti-Bomb Insurance Again.

While, with our usual modesty, we would perhaps not go so far as to claim it to be a result of the opinions expressed in the columns of FLIGHT, we have been extremely gratified to find, during the past week, that there

has been some reduction in the rates obtainable by underwriters as premiums for insurance against the possibilities of damage resulting from much exploited raids of, and bomb-dropping by, Zeppelin airships and other hostile aircraft.

Unfortunately, it would not appear that this reduction is due to any slackening off in the number of "scared" public anxious to take out policies, but rather to the fact that Lloyd's underwriters are meeting with many competitors outside the "Room" in their agreeable task of receiving "easy" half-crowns by the tens of thousand from those whose peace of mind is being disturbed by the reading of hair-raising paragraphs in the daily press with regard to the insurance of public buildings, to the huge fleets of airships that are said to be being prepared by the Germans for a visit to this country, and many other fearsome stories, the origin of which it is impossible to trace.

As we have already pointed out, the fact that Lloyd's underwriters are prepared to accept such relatively low premiums, and the added one that others are now showing an anxiety to share in the game, should be more than sufficient to carry conviction to the public mind of the small probability of an effective invasion. In any case, invasion or no invasion, if members of the public are still anxious to cover themselves from possible risk of damage to their property, the Government, even if it declines to accept that which we consider to be its duty—full responsibility on behalf of the nation for any loss that may be sustained in the direction named—ought at least to undertake the issue of war risk policies at a reasonable rate, a scheme that would immediately give confidence to the people, and, at the same time, ensure that any money they are prepared to invest in the way of insurance premiums would go to swell the national funds.

THE LEGION OF HONOUR.

In the *London Gazette* issued on Nov. 3rd it was announced that the President of the French Republic has bestowed the decoration of the Legion of Honour on the undermentioned officers of the Royal Flying Corps (Military Wing), with the approval of His Majesty the King, for their gallantry during the operations between the 21st and 30th August:—

Croix d'Officier.

Captain and Brevet Major H. R. M. Brooke-Popham, Oxford and Bucks Light Infantry.
Major J. F. A. Higgins, D.S.O., Royal Field Artillery.

THE ROLL OF HONOUR.

THE following casualties in the Expeditionary Force are reported from General Headquarters under date October 27th:—

Killed.

Crean, Captain T., Northamptonshire Regiment and R.F.C.
Hosking, Lieutenant C. G., Royal Field Artillery and R.F.C.

The following casualties among officers and men of the Royal Naval Air Service, as a result of the sinking of H.M.S. "Hermes," on the 31st ult., have been notified by the Secretary of the Admiralty:—

On Active Service.

In the *London Gazette* of the 30th ult., it was announced that Lieut.-Colonel (temporary Brigadier-General) the Marquess of Tullibardine, M.V.O., D.S.O. (August 15th), had been appointed a Brigade Com-

Croix de Chevalier.

Captain I. M. Bonham-Carter, Northumberland Fusiliers.
Captain L. E. O. Charlton, D.S.O., Lancashire Fusiliers.
Lieutenant L. Dawes, Middlesex Regiment.
Captain E. L. Ellington, Royal Field Artillery (R.F.C. Reserve).
Captain R. Grey, 1st South Midland Mounted Brigade, Warwick R.H.A.
Lieutenant W. Lawrence, 7th Battalion Essex Regiment.
Captain G. S. Shephard, Royal Fusiliers.

It is notified that there are no restrictions as to the occasions on which these Honours may be worn.

Seriously Injured.

Brodribb, Francis G., Flight Lieut., R.N.

Killed.

Collier, Tom Donald, Air-Mechanic 1st Grade, F.48.

Severely Wounded.

Saunt, Geoffrey Barfoot, Air-Mechanic 1st Grade, F.44.

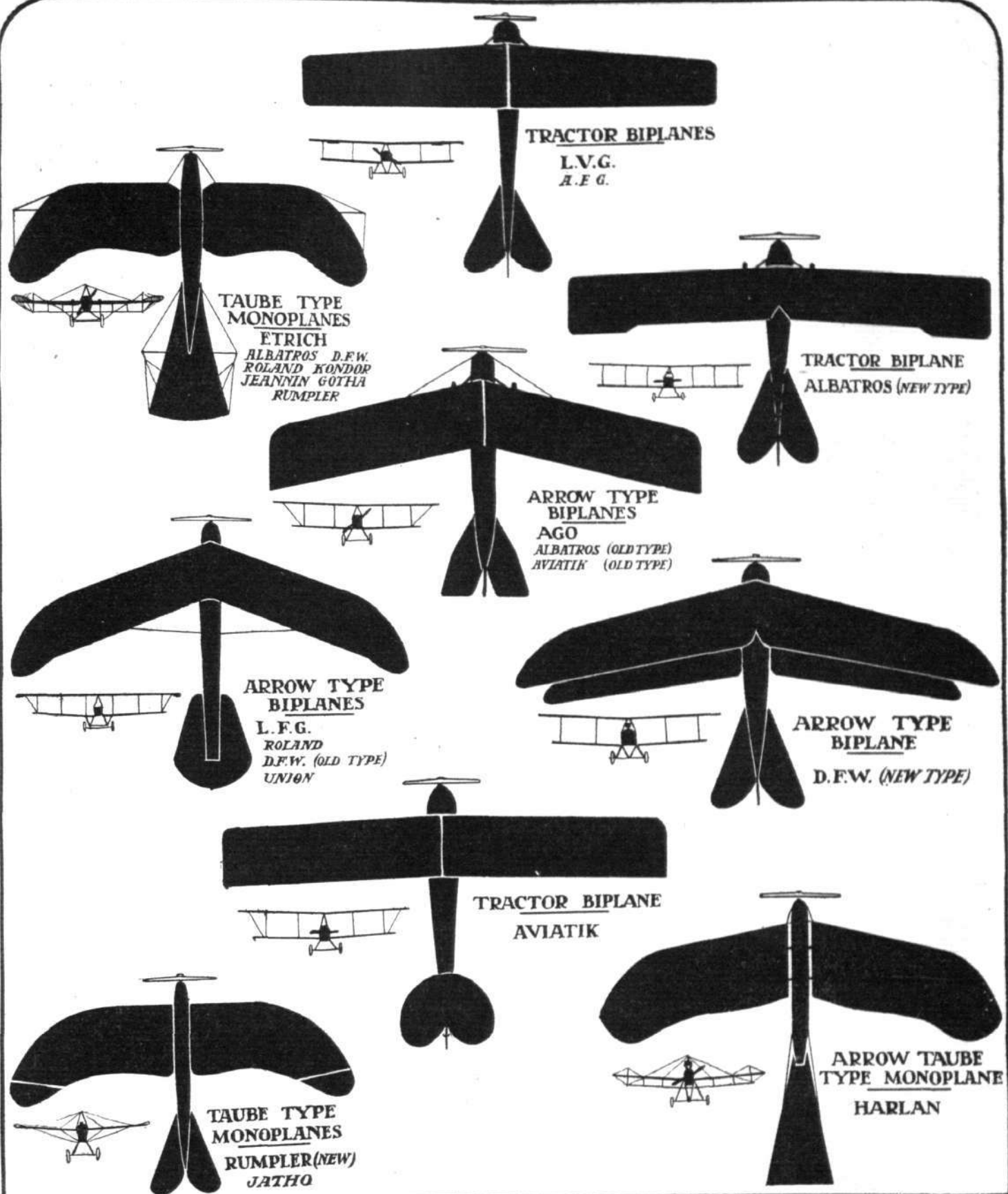
Slightly Wounded.

Godfrey, William, Petty Officer Air-Mechanic.

Missing.

Ferguson, Alexander, Telegraphist (Air Service).
Turner, John, Chief Petty Officer Mechanic.

mander, and Major General R. M. Ruck, C.B., a Chief Engineer (October 22nd). Lord Tullibardine, as our readers know, is Chairman of the Royal Aero Club, while Major-General Ruck fills a similar position in the Aeronautical Society.



"Flight" Copyright.

How to recognise German aeroplanes when in the air. With the aid of the above silhouettes of the leading types of German aeroplanes, the craft of the enemy should be readily recognised, and, to a large extent, the danger of firing on friendly pilots should be avoided. We are publishing these as a complete group at the request of a number of our readers. The names against each sketch indicate the firms which have built machines of similar appearance.

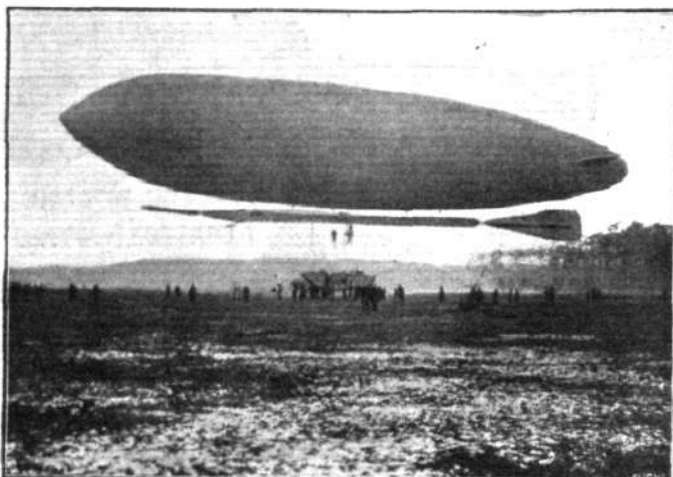
[SPECIAL NOTE.—So as to familiarise as many as possible with these aeroplanes the above may be reproduced in any publication, without fee, subject to acknowledgment as "FLIGHT" copyright.]

GERMANY'S AIRSHIPS.

(Continued from page 1077.)

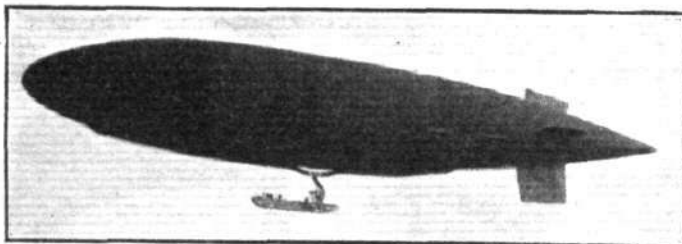
In our last issue, a short historical review of the Zeppelin series of airships was given, and this week the development of the other types of rigid, semi-rigid, and non-rigid airships will be briefly recounted.

Apart from the Zeppelin works, the only other firm which has made any serious attempt to produce a rigid dirigible is the Schütte-Lanz airship works at Rheinau, Baden. Up to the beginning of this year only three airships had been constructed by this firm. Of these,



2. The military airship M. I after the last reconstruction.

the first one, the "Schütte-Lanz 1," was completed in 1911 and taken over by the Prussian War Office. It had a length of 430 ft., and a capacity of 690,000 cu. ft. As regards the construction of the Schütte-Lanz, this has already been dealt with in a previous article, and it is only necessary to recall that it differs chiefly from the Zeppelins in that the framework is built of three-ply wood instead of aluminium. After carrying out a certain amount of cruising, the "S.L. 1" was wrecked at Schneidemühl on July 17th, 1913. The next airship to emanate from the Schütte-Lanz works was the "S.L. 2," which does not differ materially from the previous one, except in dimensions. The "S.L. 2" has a length of 470 ft. and a capacity of 780,000 cu. ft. It is now



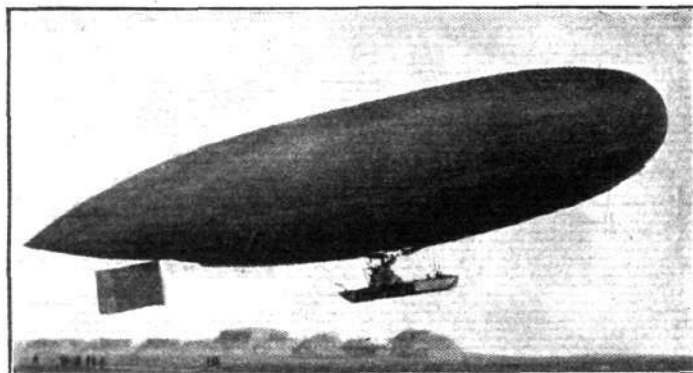
3. The Army Airship P. IV.

owned by the Prussian War Office, and has been employed in the present war, notably on the Russian frontier, where it was severely damaged by the Russians on August 28th, 1914, although the Germans claim that it was successfully repaired.

By far the largest, as well as the latest, airship to be built is the S.L. 3 which, at the beginning of the war was under construction for the Imperial Navy. This airship has a length of 542 ft. and a capacity of 1,065,000 cu. ft. If the official figures can be accepted as being correct the L.4, as she is now called, will have a speed of 48 m.p.h. and will be capable of carrying a petrol supply

sufficient for a voyage of 24 hours' duration. She is said to have been designed to carry a useful load of 17,300 lbs. As, however, the two previous Schütte-Lanz airships have not been particularly successful, the L.4 may not prove quite so formidable a weapon as her designers anticipate: in fact it is rumoured that no more S.L.s are to be built and that this firm will in the future construct Zeppelins.

The most successful representative of the semi-rigid type of airship is that known as the "M" type, designed by Major Gross and Oberingenieur Basenach, and built in the aircraft works of the Prussian War Office at Tegel, near Berlin. Owing to the strict secrecy maintained regarding the detail construction of these dirigibles very little information is available, but the general lay out combines, as the name of the type implies, the construction of the rigid and non-rigid airship. The gas bag is of the usual non-rigid type fitted with two ballonets or air chambers which, by being filled with air under pressure, serve to maintain the streamline form of the envelope. Slung from the envelope by means of a number of cords is a rigid keel built of steel tubes, on which, in the earlier models, the propellers were supported, but in the more recent vessels the propellers are mounted on tubular frames projecting out from the side of the car or cars which accommodate the crew and engines.

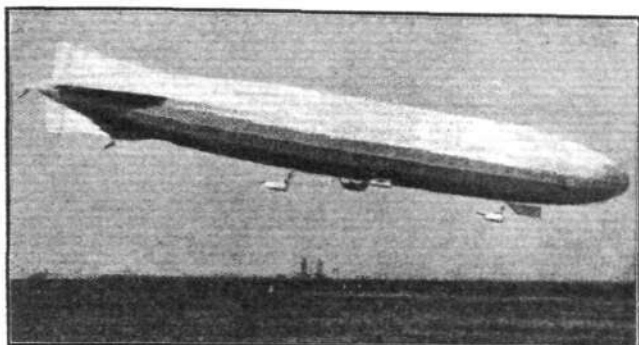


4. The Army Airship P. III.

An experimental ship, bearing the number M.I., was constructed in 1907. It had a length of 134 ft. and a capacity of 50,000 cu. ft.

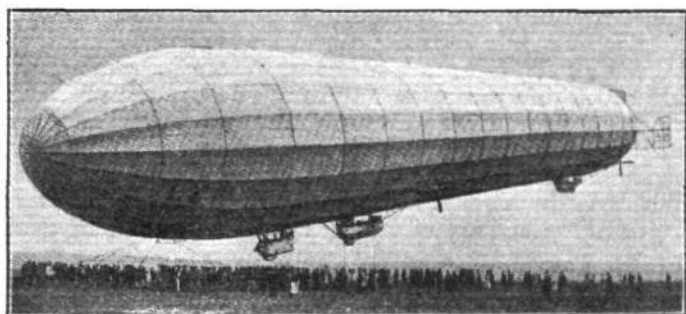
From the data obtained with this experimental airship another was built and made its appearance in the following year. This ship, which was given the official number M.I, had a length of 233 ft. and a capacity of 178,000 cu. ft. In the following year, 1909, it was reconstructed and the capacity increased to 184,000 cu. ft. Again, in 1912, the M.I was reconstructed and the length increased to 243 ft. and the capacity to 213,000 cu. ft. As far as one is able to ascertain the M.I is still in existence, but can hardly be expected to be of any great value as a war machine. The next ship in this series to appear was the M.II, which was practically identical with the M.I, and was completed in 1909. After various experimental trial trips and long delays the M.II was rebuilt in 1912, and on September 13th of last year the envelope was badly damaged by fire. The M.III made her first appearance in 1910. She was considerably larger than any of the two previous airships, having a length of 272 ft. and a capacity of 248,000 cu. ft. In 1911 her length was increased to 295 ft. and the capacity

to 320,000 cu. ft. Also this ship met with disaster in the form of a fire when it was totally destroyed in its shed at Tegel, near Berlin, on September 13th, 1911. Curiously it was also on September 13th, two years later, when the envelope of the reconstructed M.II was burned.



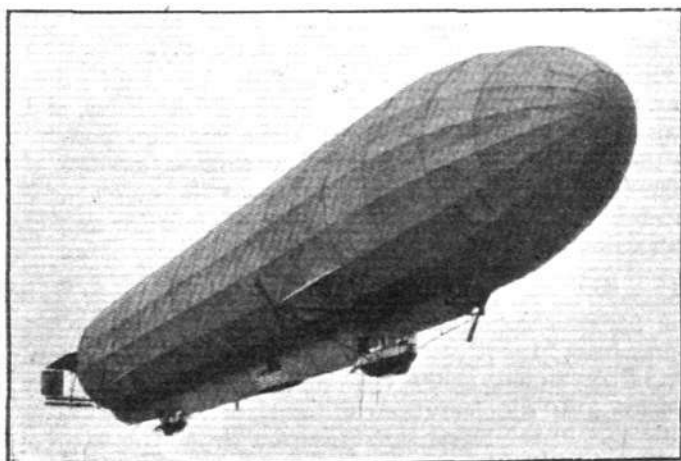
6. The Army Airship S.L. II.

M.IV, which was completed in 1911, followed, as regards its general arrangement, along the lines of previous models, but the keel, which in the earlier ships of this type was composed of a long centre section and two shorter end sections, is made up of three sections of



18. The Naval Airship L. II.

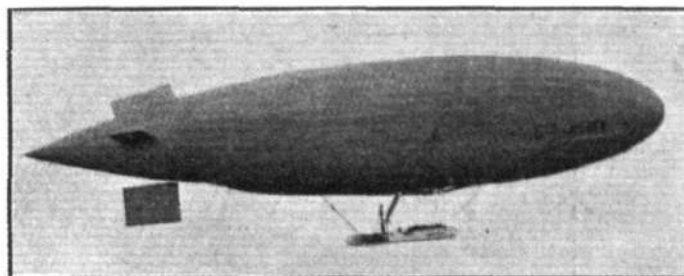
almost equal length. The propellers, instead of being supported on the keel, are carried on tubular outriggers from the car. The length of M.IV is 305 ft. and the cubic capacity 354,000 cu. ft. Last year the length was increased to 320 ft. and the capacity to 460,000 cu. ft.



19. The Naval Airship L. I.

Of later airships of the "M" class no particulars are available, but it is highly probable that several of these are being or have been completed since the outbreak of the war.

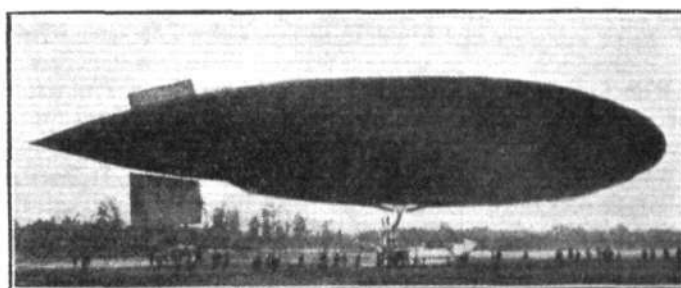
The remaining type of airship in use by the German military authorities is of the non-rigid type, and known as the P.L. class. They are built by the Aircraft Co. (Luftfahrzeug Gesellschaft, of Berlin), whose works are situated at Bitterfeld. Curiously enough this is the only firm which has been allowed to sell their products to any countries besides Germany and Austria. The Aircraft Company commenced operations in 1906 with



24. The Airship P.L. VI (ex "Stollwerck").

an experimental airship of 164 ft. length, and having a capacity of 81,500 cu. ft.

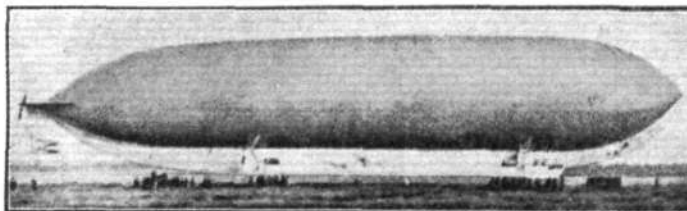
Minor alterations have been effected from time to time, but essentially the Parsevals are non-rigid airships having their car, which is of comparatively short length, slung from the envelope itself without the intermediary of a



23. The Airship "Charlotte."

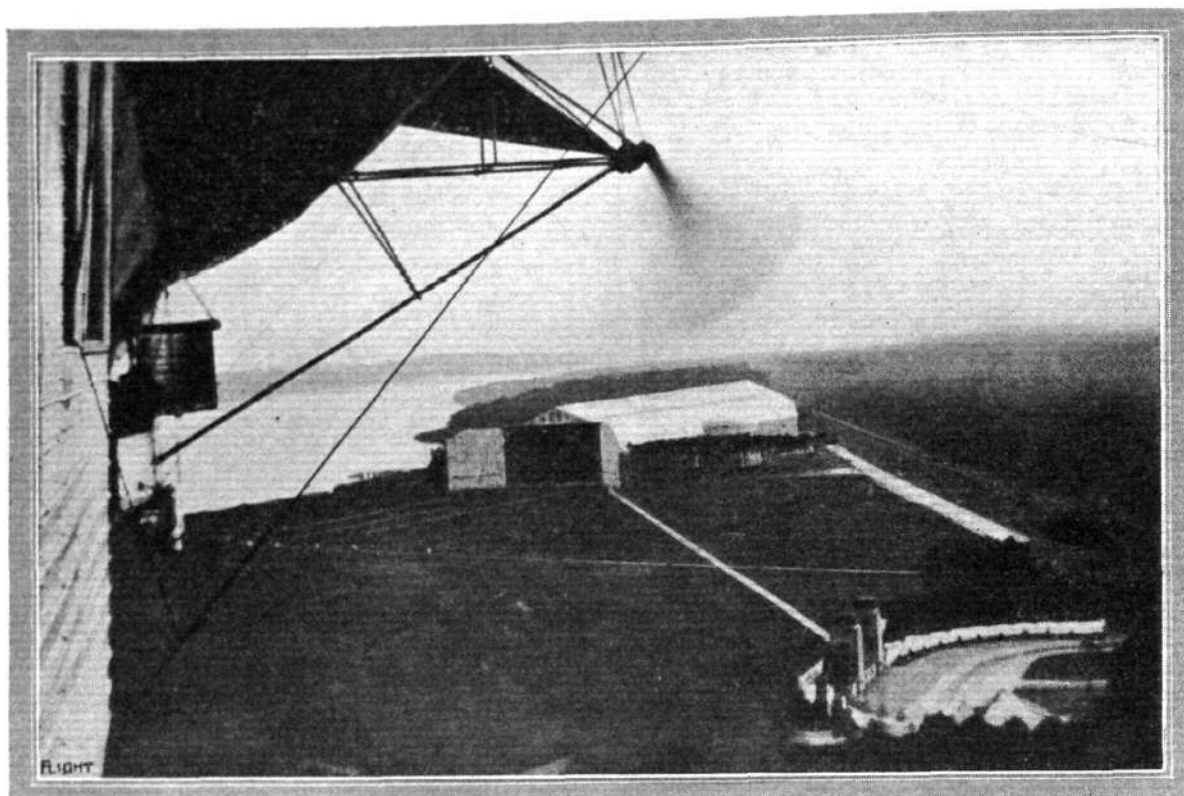
rigid keel. Of the original experimental airship nothing now remains except the car, which is on view in the Museum at Munich.

The first of the P.L. series made its appearance in 1909 and was bought by the Imperial Aero Club. It had a length of 196 ft. and a capacity of 114,000 cu. ft. The next one, the P.L.2, was of the same length, but had a greater diameter and a capacity of 142,000 cu. ft. This airship was purchased by the Prussian War Office and given the official number P.I. The third to be completed in 1909 was the P.L.3, which was also sold to the Prussian War Office and received the military number P.II. The length of P.II was 230 ft. and it had a capacity of 235,000 cu. ft. Considerable experience



25. The Airship "Veeh I."

was gained with this ship before it was ultimately wrecked by fire in May, 1911. Next in the series comes the P.L.4, which was also built in 1909. This ship, which was constructed in Austria, was taken over by the Austrian



The Potsdam dirigible shed, as seen from the passengers' cabin of the Zeppelin "Hansa."

War Office and given the name M.1. It was a sister ship to the original experimental airship and thus quite a small craft. A still smaller ship was the P.L.5, which was built for the Luftverkehrs Gesellschaft. It had a length of 132 ft. only, and its capacity was 81,500 cu. ft. On June 16th, 1911, the P.L.5 was totally destroyed by fire at Munden.

The last to be built in 1909 was the P.L.6, which originally had a length of 246 ft. and a capacity of 242,000 cu. ft., but which was later reconstructed, and its capacity increased to 320,000 cu. ft. This airship was later known as the Stollwerck.

The first to appear in 1910 was the P.L.7, which had a length of 236 ft. and a capacity of 270,000 cu. ft. Its acceptance trials were held at Salisi, near Gatschina, in Russia, and resulted in its being taken over by the Russian Government, who gave it the name "Griff." Next in the series was the P.L.8, of 253 ft. length and 284,000 cu. ft. capacity. This airship was purchased by the Prussian War Office to replace the destroyed P. II (P.L.3). A smaller ship, the P.L.9, also built in 1910, was sold to Turkey in 1913. She only had a length of 132 ft. and a capacity of 60,000 cu. ft., which was, however, increased later to 164 ft. and 78,000 cu. ft. respectively. A sister ship, the P.L.10, was up to the

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The Loss of the "Hermes."

ON Saturday night the following statement was issued by the Admiralty:—

"The old cruiser 'Hermes' (Captain C. R. Lambe), which has been recently used as a seaplane-carrying ship, was sunk to-day by a torpedo fired by a German submarine in the Straits of Dover as she was returning from Dunkirk. Nearly all the officers and crew were saved, but the exact loss cannot be ascertained until the men are mustered. The loss of the vessel is of small military significance."

It will be remembered that H.M.S. "Hermes" was

time of the outbreak of war lying dismantled in the shed at Bitterfeld.

In the following year, 1911, only one airship was finished, which was sold to the Prussian War Office and received the military number P.III. The length of this ship is 275 ft., and she has a capacity of 355,000 cu. ft. P.L.12, which emanated from the works in the beginning of 1912, was 260 ft. long and had a capacity of 312,000 cu. ft. She was purchased by the Rheinisch-Westfälische Flug und Sportsplatz, and was employed by this firm for passenger carrying and advertising. The next ship, P.L.13, which was sold to the Japanese Government, was 260 ft. long, and her capacity was 302,000 cu. ft. The Russian Government purchased the next ship, the P.L.14, which was completed in 1913. The length of Parseval 14 was 280 ft., and her capacity 355,000 cu. ft. Now followed a number of ships of practically the same size as P.L. 14, of which the P.L. 15 was sold to Italy, P.L. 16 to the Prussian War Office (P. IV), P.L. 17 to Italy; a smaller one, the P.L. 18, was purchased by the British Navy, and three—the P.L.'s 19, 20 and 21—by a "foreign power," as the Parseval works put it. These latest airships, if they were not delivered by the time of the commencement of the war, may safely be assumed to be in the possession of the Prussian War Office.

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the parent ship of the Naval Wing of the Royal Flying Corps from May 7th to December 23rd, 1913. She was out of commission at the beginning of the war, but since August 31st she had been utilized for duty connected with the Royal Naval Air Service. From the list on p. 1090 it will be seen that Flight-Lieut. Brodribb was severely injured, one air mechanic killed, two wounded, and one P.O. mechanic missing. It is understood that Flight-Lieut. Busted and Flight Sub-Lieuts. Garnett and Holmes were also on board the "Hermes" and that they escaped.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL COMMITTEE MEETING.

A SPECIAL MEETING of The Committee was held on Tuesday, the 3rd inst., when there were present:—Prof. A. K. Huntington, in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Mr. C. F. Pollock, and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Maurice Leigh Gardner.
Flight-Commander de Courcy Wyndor Plunkett Ireland, R.N.A.S.
Cyril Napier Leeston-Smith.
Sub-Lieut. Frederick William Lucas, R.N.V.R.
Walter Shackfield Newton-Clare.
Flight-Lieut. Arthur Nickerson, R.N.A.S.
Capt. James Ramsay Wigan.

Aviators' Certificates.—The following Aviators' Certificates were confirmed:—

- 942 Flight Sub-Lieut. John Joseph Petre, R.N.A.S. (E.A.C. Biplane, Eastbourne School, Eastbourne). Oct. 14th, 1914.
- 943 Alexander Burnell Rendall (Maurice Farman Biplane, Military School, Brooklands). Oct. 19th, 1914.
- 944 2nd Lieut. Cecil Harloven Saunders, R.F.C. (Maurice Farman Biplane, Central Flying School, Upavon). Oct. 21st, 1914.
- 945 Flight Sub-Lieut. Arthur Ethelbert Griffin, R.N.A.S. (Maurice Farman Biplane, Central Flying School, Upavon). Oct. 21st, 1914.

The following Aviators' Certificates were granted:—

- 946 Flight Sub-Lieut. Reginald Eycott Nicoll, R.N.A.S. (Maurice Farman Biplane, Central Flying School, Upavon). Oct. 21st, 1914.
- 947 Flight Sub-Lieut. Joseph Alexander Allen, R.N.A.S. (Grahame-White Biplane, Grahame-White School, Hendon). Oct. 23rd, 1914.
- 948 Flight Lieut. Christopher Hornby, R.N.A.S. (Short Biplane, Naval Flying School, Eastchurch). Oct. 24th, 1914.

- 949 Flight Sub-Lieut. Edwin Harris Dunning, R.N.A.S. (Short Biplane, Naval Flying School, Eastchurch). Oct. 24th, 1914.
- 950 Flight Sub-Lieut. Tom Harry England, R.N.A.S. (Grahame-White Biplane, Grahame-White School, Hendon). Oct. 25th, 1914.
- 951 Flight Sub-Lieut. Evan Bernard Morgan, R.N.A.S. (Grahame-White Biplane, Grahame-White School, Hendon). Oct. 25th, 1914.
- 952 Cyril Charles Wigram (Maurice Farman Biplane, Military School, Brooklands). Oct. 26th, 1914.
- 953 Flight Sub-Lieut. Marmaduke Scott Marsden, R.N.A.S. (Henry Farman Biplane, Central Flying School, Upavon). Oct. 26th, 1914.
- 954 Malcolm Grahame Christie (Caudron Biplane, Prosser School, Hendon). Oct. 27th, 1914.

Legion of Honour.

With the approval of the King, President Poincaré has decorated the following Members of the Royal Aero Club with the Legion of Honour for gallantry during the operations between August 21st and 30th, 1914:—

Major H. R. M. Brooke-Popham, R.F.C.
Major J. F. A. Higgins, D.S.O., R.F.C.

Presentation to Club Library.

Mr. H. Massac Buist has kindly presented to the Club Library a copy of his book "Aircraft in the German War."

New Members.

Members are reminded that according to the Rules, the Annual Subscription of any New Member they may propose, who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1915.

Royal Aero Club Burgee.

Burgees, embodying the design recently approved by His Majesty the King, namely the Royal Crown with the Caduceus, can now be obtained by Members from the Royal Aero Club, price 6s. each.

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

THERE was not so much flying last week owing to the weather being rather rough. The Sopwith and Vickers' gun 'buses were out, Flight Commander Ireland leaving for service on the former; also four Shorts and Maurice Farman. Flight Commander Babington and Lieut. Pickles flew over from the Isle of Grain, returning the same day (Wednesday).

The airship "Astra-Torres" passed over the aerodrome on Wednesday, keeping very low.

Brighton-Shoreham Aerodrome.

Pashley Bros. and Hale School.—Instructors for last week, E. and C. Pashley. Up with instructors, J. Sibley, J. Morrison, circuits and eights, J. Woodhouse, T. Cole, Menelas Babiottis, C. Winchester. Machines in use, two Henry Farmans, one Avro, one Pashley biplane. Capt. Perkins has returned to the school after his rest cure.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Last Saturday week, Prob. Flight Sub-Lieuts. England and Morgan took brevet tests and gained certificate. Prob. Flight Sub-Lieuts. Hodsoll and Price, straights with Instructors Manton and Russell.

On Sunday, Prob. Flight Sub-Lieuts. Bray, Cooper and Barnes, straights with Instructors Shepherd and Russell.

Monday, Prob. Flight Sub-Lieuts. Ffield, solo straights,

Groves and Young straights with Instructors Manton and Russell. Mr. Carabajal circuits and eights. Mr. Easter solo circuits.



Mr. P. W. Abbott, who recently passed his *brevet* tests on a 45 h.p. Caudron biplane at the British Caudron School, Hendon.

Tuesday, Mr. Easter, landing practice. Mr. Liu and Prob. Flight Sub-Lieuts. Barnes, Bray, Hodsoll, Price, Young, and Watson, straights with Instructors Manton, Winter, Russell and Shepherd.

Wednesday, Mr. Carabajal and Mr. Easter solo circuits and special landing practice alone, Mr. Liu passenger flights and straight flights with Instructor Shepherd. Prob. Flight Sub-Lieuts. Barnes, Bray, Cooper, Hodsoll, Price, Watson, Young, straights with Instructors Manton, Winter, Russell and Shepherd. Prob. Sub-Lieut. Groves straights with Instructors Manton and Shepherd, and afterwards alone. Prob. Flight Sub-Lieut. Field solo straights and half circuits, and passenger instructive flights with Instructors Manton and Russell.

Thursday, bad weather, instruction in hangars.

Beatty School.—Pupils being instructed last week on "dual"-controlled machines. Instructors: Mr. Geo. W. Beatty and Roche-Kelly. The following pupils received instruction: Messrs. Gardner, Parker, Whitehead, Jenkinson, Leeston-Smith, Geo. Beard, Beynon, Newberry, Monfeal and Le Vey.

British Caudron School.—Monday, last week, school out in the evening. Mr. Ivermee circuits and figures of eight. Messrs. Stevens, Barfield, Beynon and Christie doing straights. Messrs. Burke and Williams rolling. Prob. Sub-Lieuts. Bird and Tench rolling.

Tuesday morning too windy. Evening, Messrs. Barfield, Stevens and Beynon doing straights, Mr. Ivermee right-hand turns and landings. Mr. Williams rolling. Sub-Lieuts. Bird and Tench rolling.

Wednesday morning, Mr. Ivermee figures of eight, Mr. Barfield straights, Messrs. Burke and Williams rolling, Sub-Lieut. Bird doing straights, Sub-Lieut. Tench rolling. Evening, Mr. Ivermee circuits, Messrs. Barfield and Stevens doing straights, Messrs. Burke and Williams and Sub-Lieut. Bird, straights. Sub-Lieut. Tench rolling.

Thursday, Friday and Saturday weather too bad.

Hall School.—Monday, last week, gale. Tuesday, windy. J. Rose four circuits at an altitude of 400 ft. J. L. Hall five minutes on *brevet* bus. Wednesday, J. Rose seven circuits at 600 ft., and *vol plané* landing. Archie Davy three straights. J. L. Hall quarter hour on *brevet* tractor. Sunday, very windy. Lloyd Williams eleven straights, Archie Davy four, Mitchell two, and R. Pinniger two straights. J. Rose practically ready for *brevet*.

London and Provincial Aviation Co.—Monday, last week, W. T. Warren test flight, Messrs. Moore and Abel rolling. Tuesday, W. T. Warren test flight, Messrs. Abel and Derwin rolling, Mr. Moore straights. Wednesday, M. G. Smiles test flight, Messrs. Moore and Abel rolling. Friday, M. G. Smiles test flight, Messrs. Moore and Abel rolling.

THE BRITISH AIR SERVICES.

Royal Naval Air Service.

THE following were announced by the Admiralty on the 29th ult. :—

Probationary Flight Sub-Lieuts. V. Nicholl, J. J. Petre, F. G. T. Dawson, and M. E. A. Wright have been confirmed in the rank of Flight Sub-Lieutenant, with original seniority, and appointed to "Pembroke," additional, for R.N. Flying School, Eastchurch. October 23rd.

The undermentioned have been entered as Probationary Flight Sub-Lieutenants, and appointed as follows: G. H. Scott, to the "Pembroke," additional, for course of instruction at Farnborough Naval Airship Station, October 24th; P. E. H. Wakeley, T. F. Driscoll, and G. E. Livock, to the "Pembroke," additional, for duty with R.N. Air Service at Hendon; C. W. Dickinson, to the "Pembroke," additional, for duty with R.N. Air Service at Farnborough; and C. H. Chichester Smith, to the "Pembroke," additional, for R.N. Flying School, Eastchurch, October 27th; R. M. Field, to the "Pembroke," additional, for course of instruction at Hendon, October 28th; F. G. Andreas and J. C. Brooke, to the "Pembroke," additional, for course of instruction at Central Flying School, November 2nd.

The following appeared in the supplement to the *London Gazette* issued on the 29th ult. :—

6th Batt. Royal Fusiliers (City of London Regt.).—Capt. (temp. Maj.), Special Reserve of Officers, Wilfred G. Lucas, to be Major; October 30th, 1914. Maj. Wilfred G. Lucas is seconded for service with the Royal Naval Air Service; October 30th, 1914.

The following were announced by the Admiralty on the 31st ult. :—
The undermentioned probationary Flight Sub-Lieutenants have been confirmed as Flight Sub-Lieutenants, with seniority as follows: J. D. Maude, August 1st; J. M. D'A. Levy, August 5th; the Hon. Desmond O'Brien, August 18th; and G. L. Thomson, August 24th; and all appointed to the "Pembroke III," additional, for R.N. Air Service. To date October 30th.

Cecil Paget has been granted a temporary commission as Lieut.-Commander, R.N.V.R., and appointed to the "Pembroke III," additional, for duty with R.N. Air Service. October 27th.

William H. Reid, Charles H. Parkes, Ernest H. Pooley, Felton Atkinson, and Ronald Marshall have all been granted temporary commissions as Sub-Lieutenant, R.N.V.R., and appointed to the "Pembroke III," additional, for duty with R.N. Air Service. To date October 27th.

The following were announced by the Admiralty on the 2nd inst. :—
Commander R. Groves to the "President," additional, as assistant to Director of Air Department, with temporary rank of Wing Commander. To date October 29th.

Engineer-Lieut. T. Cave-Brown-Cave, promoted to Engineer-Lieut. Commander with seniority of November 1st.

Walter Newton-Clare entered as Probationary Flight Sub-

Lieutenant, and appointed to the "Pembroke III," for duty with Royal Naval Air Service. To date October 30th.

The following promotions were announced by the Admiralty on the 4th inst. :—

Flight Lieuts. R. L. Marix, D.S.O., D. Hyde-Thomson, E. D. Robertson, W. Briggs, C. F. Kilner, H. A. Williamson, E. T. R. Chambers, F. G. Brodribb, promoted to the rank of Flight Commander, with seniority of October 31st.

Sub-Lieuts. F. M. Barr, H. G. Wanklyn, J. M. R. Cripps, E. B. Baumann, S. F. Lau-Davies, S. Pickles, T. W. Elsdon, H. S. Adams, and G. M. Dyott, promoted to the rank of Flight Lieutenant, with seniority of October 31st.

Royal Flying Corps (Military Wing).

THE following appeared in the supplement to the *London Gazette* issued on the 29th ult. :—

Lieut. W. F. R. Dobie, Gordon Highlanders, ceases to belong to the Reserve. October 30th, 1914.

Supplementary to Regular Corps.—Malcolm McB. Bell-Irving to be Second Lieutenant on probation. October 21st, 1914.

The following appeared in the *London Gazette* of the 30th ult. :—
The undermentioned officers to be Flying Officers, and to be seconded; dated Oct. 19th, 1914 :—Sec. Lieut. Montagu R. Chidson, Royal Artillery, and Lieut. Francis H. Eberli, Royal Artillery.

Sec. Lieut. William C. Adamson, Special Reserve, to be a Flying Officer. Dated October 2nd, 1914.

The following appeared in a supplement to the *London Gazette* issued on the 2nd inst. :—

Temporary appointment made.—Capt. Arthur B. Burdett, York and Lancaster Regt., from a Flying Officer to be a Flight Commander, October 17th, 1914.

Supplementary to Regular Corps.—Cyril C. Wigram to be Second Lieutenant (on probation), November 2nd, 1914.

The following appeared in the *London Gazette* of the 3rd inst. :—
His Majesty the King has been pleased to approve of the undermentioned Colonel (temporary Brigadier-General) being promoted to the rank of Major-General for distinguished conduct in the field, dated October 26th, 1914 : Sir David Henderson, K.C.B., D.S.O.

Supplementary to Regular Corps.—The undermentioned Second Lieutenants to be Lieutenants. Dated September 16th, 1914 : Edward N. Fuller, Christopher W. Wilson, Gordon N. Humphreys, David E. Stodart, Arthur A. B. Thomson, and Louis A. Strange.

The seniority of the undermentioned Lieutenants whose promotion appeared in the *Gazette* of October 15th, 1914, is as now stated : D. C. Ware, next below C. W. Wilson; A. L. Russell, next below D. A. Stodart.

The following appeared in a supplement to the *London Gazette* issued on the 4th inst. :—

Supplementary to Regular Corps (Military Wing).—Sec. Lieut. (on probation) John C. Joubert de la Ferté is confirmed in his rank.

INSTRUMENTS USED IN EXPERIMENTS ON AEROPLANES.

AERONAUTICAL research is very frequently regarded as limited to the work carried on either in or in connection with a laboratory, probably because the investigations made are of more or less general application, and the results obtained are freely published. There is, however, another branch of experimental work which under normal conditions goes on practically continually, but of which comparatively little is heard, because it is conducted on actual aeroplanes, and, as such, is of more particular interest to the constructor who carries out the test. For

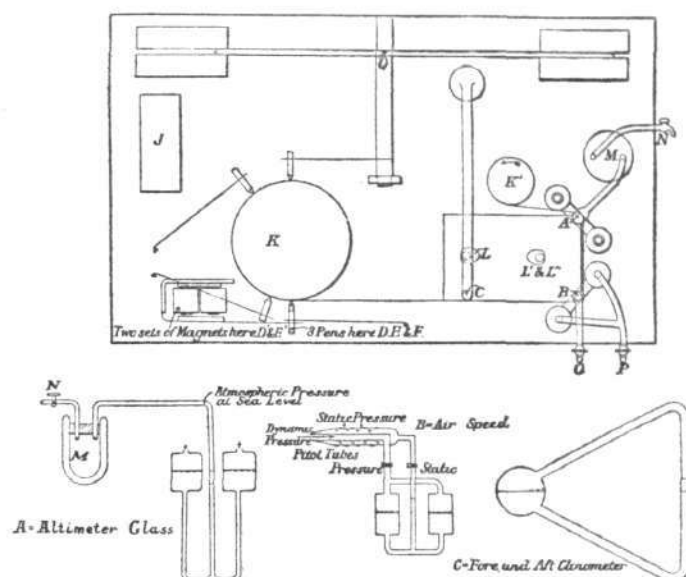


Fig. 1.—A diagrammatic sketch showing the internal arrangement and details of the Ripograph.

the carrying out of these tests it is necessary to have certain instruments, and three of them are dealt with in the following notes.

Descriptions of the earlier forms of the trajetograph and the tautness-meter, which, as well as the ripograph, are manufactured by the Cambridge Scientific Instrument Co., have already appeared in *FLIGHT*, but various improvements have since been incorporated in their design, and the present construction is shown in the accompanying illustrations.

The *ripograph* (see Figs. 1 and 2) has been most extensively employed by the staff of the R.A.F. in their full-scale experimental work, and enables records to be taken of many of the more important data required to determine the performance of an aeroplane in flight. The nine different quantities—the altitude, the speed relative to the air, the longitudinal inclination of the aeroplane, the time, the engine speed, the positions (3) of the control levers and the rolling movement—are automatically recorded upon a band of photographic paper which is drawn by the drum, K (Fig. 1), at a speed of 100 mm. per minute around the outside of the box containing the lamps L, L¹, L¹¹. The drum is rotated by clockwork, and the records are made by three shadow photographs on the inside of the paper and six pencils on the outside surface.

The altitude is measured by means of an altimeter, A, which consists of a double U tube partly filled with liquid and connected to a Dewar flask, M. The cock, N, is first opened so that the pressure in the Dewar flask and the outer limbs of the altimeter is that of the air at the surface of the earth, but previous to commencing

a flight this cock is closed. The pressure of the air in the inner tube of the altimeter is then constant, namely, that of the air originally introduced; but since the pressure on the outer limbs is that at the elevation at which the aeroplane fitted with the instrument may be flying, the height of the liquid in the tube may be made to indicate the altitude of the aeroplane. The object in view in arranging the two limbs of the double U tube symmetrically about the tube communicating with the Dewar flask, is to compensate for errors due to the possible tilting of the instrument.

The *air speed* is ascertained by means of an instrument that resembles the Velometer air-speed indicator in principle, as well as in general construction—the static and dynamic sides of the pressure head, B, which is mounted in a suitable position, as usual, at some distance from the body of the aeroplane, being connected by tubing to the cocks, O and P. The fore and aft *clinometer*, C, is formed by a triangular tube, which is partly filled with a special liquid, and is arranged in a vertical plane containing the normal direction of motion, so that it shows by the movement of the liquid in its vertical limb, the longitudinal motion of the aeroplane. The object of fitting the large bulb at the apex of the triangle is to increase the movement of the liquid in the vertical limb for a given angular displacement of the aeroplane, and thus permit of greater accuracy in the records.

The readings on these instruments are registered by shadow photographs of their respective liquid columns, A, B and C, projected by the lamps, L, L¹, L¹¹, on the sensitised side of the photographic paper (see Fig. 1).

The *time* is registered on the paper by dashes marked by the pencil, D, which is depressed by the electromagnet, D¹; and this is operated from an accumulator every quarter of a minute by a four-spoked fitting which is rotated once per minute by the clock drum, J. The *engine speed* is recorded in a series of dashes which are

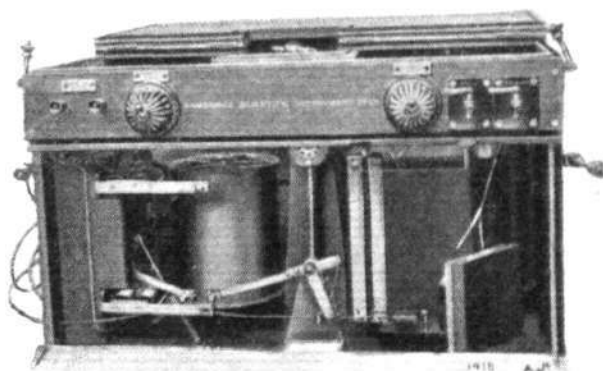


Fig. 2.—An outside view of the Ripograph.

made every 100 revolutions by the pencil, E, the latter being actuated by an electromagnet, E¹, the circuit through which is controlled by a cam placed on a spindle driven by a worm reduction gear (giving a speed reduction of 1 : 100) off the crank-shaft of the engine by flexible shafting. The pencils, D and E, are placed in the same vertical plane in order to facilitate the reading off of the speed of revolution of the engine.

For recording the movement of the controls, a Bowden wire from the elevator lever operates the T-shaped lever, L, and the movement is transmitted to the pencil, F,

through a safety spring device, which takes up the excess motion of the lever should it be accidentally moved too far. The mechanisms for registering the position of the rudder and the amount of warp are similar in construction to that used for recording the motion of the elevator; while the rolling motion of the aeroplane is recorded by a large weighted pendulum, Q, which is carried in ball bearings at the back of the instrument. This pendulum has a long period, and is suitably connected to a pencil, which makes a record of the motion on the paper passing over the drum, K. The weight of this apparatus, complete, is 84 lbs.

The *trajectograph* is essentially a simpler form of the ripograph, since it contains the devices used in the latter for determining the altitude and the velocity. This instrument was designed by the staff of the R.A.F., and was used in the Military Aeroplane Trials of 1912 for measuring the gliding angles and velocities and the gradients in ascents of the competing machines.

The instrument consists of a double box, one part of which is light tight, while the other part contains the illuminating apparatus. In the former are—(1) an altimeter; (2) a specially designed pressure gauge, which is connected to a pressure head and is used for determining the air speed of the aeroplane; (3) the necessary clock-work mechanism for driving a band of sensitised paper past the two gauges; and (4) a time marker, which gives a shadow record on the moving paper at intervals of 30 secs. But as the method of operation and the construction of these devices are similar to those of corresponding parts in the ripograph, it is unnecessary to describe them further here. It may, however, be mentioned that the *trajectograph* can be loaded in daylight with new spools of paper 5 ins. wide and 10 ft. long.

The *tautness-meter*, which in its original form was designed by Mr. Mervyn O'Gorman, is shown in Fig. 3, and has been extensively employed at the R.A.F. for the purpose of ascertaining the stresses in cables, wires, &c.,

in the assembling and truing up of aeroplanes, as well as during flight. The instrument is applied to the cable, so that the latter rests in the grooves in the pulleys, C C'. The pulley, C, is carried on a bell-crank lever, P, pivoted at N on a rigid framework, on which the other pulley, C', is directly mounted at the opposite end. The support P' is rigidly connected to the cross-bar, and between the extremities of P and P' is a strong spiral spring, S S, which is enclosed within two metal tubes—one of which telescopes into the other. A screwed

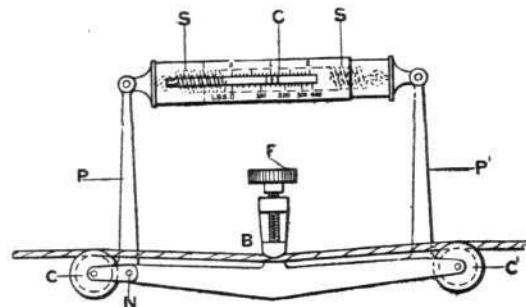


Fig. 3.—The Tautness-meter.

piece, B, mounted upon the framework, presses on the cable at a point midway between the two pulleys, so that when the screw, F, is screwed down sufficiently, it bends the cable slightly, thus putting a light load on the spring, S S, which is recorded on the graduated scale cut along the outer of the two tubes enclosing the spring. In practice, as the extension on the cable increases, or decreases, either when adjusting the turnbuckles, or due to the loading produced under varying flight conditions, the cable becomes straighter, or more bent, and hence further increases, or decreases, the load upon the spring, which may then be read off directly from the scale in lbs., kilos., or tons.

This instrument is supplied by the Cambridge Scientific Instrument Co. at a price of £7.

HOW BAROGRAPHS USED DURING ATTEMPTS ON HEIGHT RECORDS ARE TESTED.

AN account of the procedure adopted in examining barographs taken from aeroplanes upon which attempts have been made to establish height records is given in the report of the Director of the National Physical Laboratory for 1913-14, and should prove of considerable interest to readers of FLIGHT.

The instrument is received at the Laboratory in exactly the same state as it was found on the aeroplane after the completion of the flight, except that the pointer has been lifted from the paper. The testing apparatus contains two receivers, one in which the test on the barograph is carried out, and the other an auxiliary receiver which is used to control the pressure inside the first receiver. The pressures are determined by means of a standard gauge barometer of the U type and can be estimated to 0.001 of an inch. The clockwork is set going and the instrument placed in the receiver of the testing apparatus, in which the pressure is adjusted so that the pointer falls on the beginning of the trace. As the drum revolves the pointer is made, by suitable variation of the pressure, to follow closely over the trace made during the flight. At intervals along the trace, the corresponding true pressures are read on the standard gauge

barometer. In this way a very accurate estimate of the true pressure corresponding to the maximum point on the trace can be made.

To arrive at the actual height reached above ground level, it is necessary to know the following data:—(1) The place of ascent and its height above mean sea level; (2) the date and hour of ascent; (3) the difference between the pressure at ground level and that at the maximum height. The particulars given under (1) and (2) are referred to the Meteorological Office, to ascertain as closely as possible from their records the atmospheric conditions at the time and place of flight. Item (3) is got direct from the calibration of the barograph at the Laboratory. The information necessary for calculating the maximum height attained is then complete.

The degree of accuracy to which the height can be certified depends partly upon the closeness of the barograph scale and the thickness of the trace, and partly on the amount of information available as to the atmospheric conditions at the time of the flight. For the two instruments tested during the past year, the results were given to within ± 200 feet.

EDDIES.

QUITE a deal of flying was seen at Hendon on Saturday last. Although there was a little too much wind to make school work pleasant, a goodly number of flights were made by the more experienced pilots. Several Caudrons as well as some of the school 'buses were out, and later one of the M. Farman's went for a spin round the aerodrome. M. Merriam also displayed to good advantage the airworthy qualities of the Handley Page biplane. Owing to its effective silencer this machine can barely be heard when flying at anything above a couple of hundred feet, and it would seem to be particularly suitable for such work as the air raids into Germany, not only on account of its quietness, but also because of its resemblance to the German Arrow type biplanes. As regards speed, they are certainly as fast as the majority of German machines.

A new Grahame-White biplane was also out for an airing and created a very favourable impression. The new machine is of the "pusher" type, having a nacelle projecting out in front; the propeller being placed immediately behind the trailing edge of the wings. The upper plane has a very considerable overhang and the leading edge is swept back, H. Farman fashion. A single tail plane and twin rudders are carried on an outrigger of the usual form. With the 60 h.p. Le Rhone engine at present fitted, she will carry a passenger in addition to the pilot, and Mr. "Bill" Law, who is responsible for the design, is confident that she will have no difficulty in carrying an extra passenger.

Talking of new machines reminds me that there is one rapidly approaching completion at the works of the British Caudron Co. Judging from the various parts which I inspected the other day, this latest product promises to be a considerable improvement on previous models. As the new biplane is designed to give greater speed than the older ones, the span of the top plane has been reduced, with the result that the slanting struts, which usually take the weight of the extensions, are done away with, and a certain amount of reduction of head resistance is effected. In order to further increase the speed, the wing section has been made slightly flatter than that of the standard types, and all the inter-plane struts are considerably deeper than usual, so that a better streamline form is obtained. The workmanship and finish of the different parts leave nothing to be desired, and great improvements over the original French design of sockets have been effected. All sockets and clips in this machine are made of steel, and the sheet-steel boxes round the spars and tail booms where these are attached to the struts make a much more satisfactory job than the old type. Instead of the old type shallow sockets for the inter-plane struts much deeper steel sockets, the sides of which extend along the sides of the struts for a distance of several inches, are fitted. The method of attaching the nacelle to the planes has also been improved, so that it now becomes a matter of a few minutes only to detach the nacelle from the rest of the machine, an operation requiring a comparatively long time in the standard 'buses. Taken together this latest product of the British Caudron firm gives every promise of good performances when finished, which should be in the course of the next couple of weeks or so.

Congratulations to Mr. A. C. Hunter, the very capable manager of the Caudron school, and Mr. R. Desoutter,

their chief pilot, on their escape from what might easily have been a serious accident. On Saturday last, while travelling on a motor bicycle, a motor car ran into them, with the result that they had a rather nasty "spill," and both had to be taken to a doctor to be "tuned up." At the time of writing they were both doing well; in fact, Mr. Hunter paid a visit to Hendon on the same afternoon, although his leg was causing him considerable pain, and he is now attending to his duties as usual.

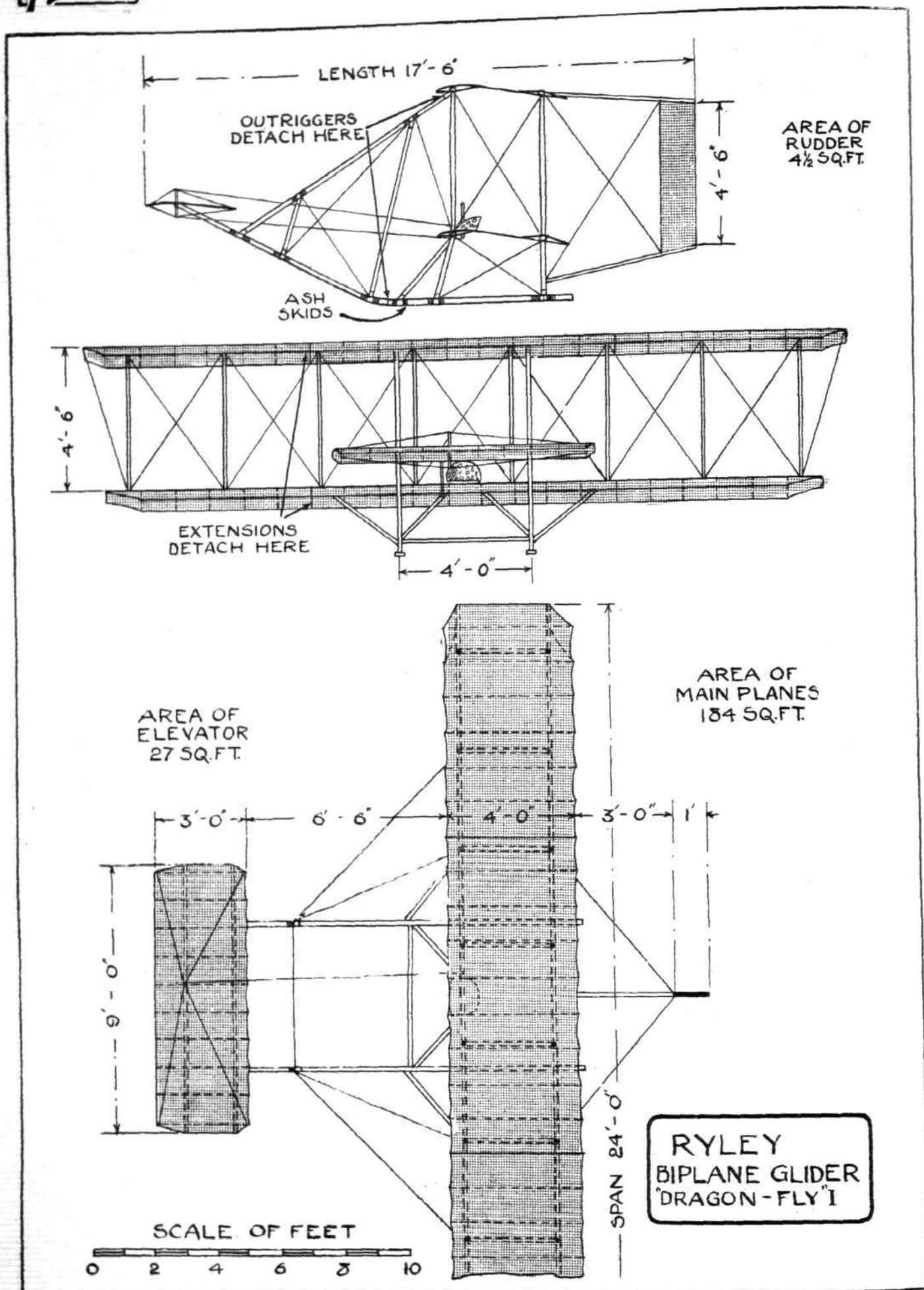
One of the latest Sopwith scouts which are doing so well out at the front was seen at Hendon recently. It was fitted with a simple type Vee chassis of steel tubes, carrying a tubular non-sprung axle, springing being effected by the large diameter Palmer tyres. I understand that this 'bus is shortly going to the front. May it carry another of our daring aviators safely across the frontier and back to some purpose.

It is good news to learn that the Avro firm are absolutely full up with work, having received orders for—well, never mind how many of their standard 80 h.p. tractors, for the War Office and Admiralty. The Avros have proved triumphantly their power to stand up to the arduous task required of them under actual service conditions in a way that—well, that all who know the Avro products expected. That their merits are appreciated in the proper quarter is gratifying, and Mr. Roe is now coming into his own, and reaping the reward for the grit and perseverance with which he stuck to his guns from the early days of aviation. Those who remember "A.V." in the days away back when he experimented with his little triplane on Lea marshes, and managed to coax it into the air assisted by a 9 h.p. engine only, realise that these preliminary products had in them the germ of the up-to-date machine which has now brought him material reward, and will appreciate to how great an extent he had already in those comparatively dark ages mastered his subject. And it is well to remember that Mr. Roe was the originator of the tractor-type biplane, which is now coming into almost universal use.

Among firms who are enjoying large orders for machines must be mentioned Messrs. Martin and Handasyde, of Brooklands, who are busy turning out their new type scouting biplanes. These machines, the first of which made its appearance not very long ago, have met with a very favourable reception, and as the type is doing very good service at the front, and the Martinsyde workmanship is synonymous with high quality, in aviation circles it is not surprising to learn that they are greatly in demand. Mr. Raynham, who somehow or other manages to find time to test these machines in addition to numerous Avros, is very pleased with their behaviour, and as Raynham, "the Glider," has had great experience with such a variety of types, his opinion carries considerable weight.

Another Brooklands pilot—Mr. Dukinfield Jones—whose flying on the D.F.W. biplanes will still be remembered, has, I understand, joined Messrs. Beardmore, where his knowledge of the peculiarities of the D.F.W. machines, for which Beardmores hold the British rights, will, no doubt, be of great service. All his many friends will join me in wishing him every success in his new position.

"ÆOLUS."



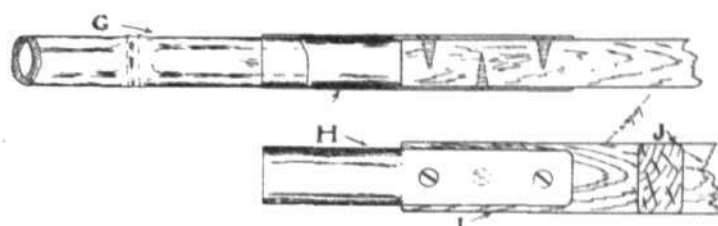
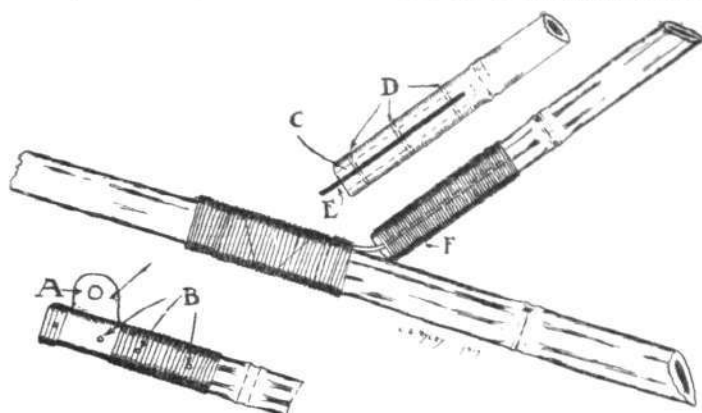
THE RYLEY BIPLANE GLIDER.—Plan, side and front elevations to scale.

THE RYLEY BIPLANE GLIDER.

MR. L. G. RYLEY, of Coventry, sends us the following description and sketches of a biplane glider which he has built, and with which he hopes to make some interesting experiments shortly. Mr. Ryley informs us that although he is a member of the Coventry Aero Club, the glider is not built by the Club, but that he will be quite willing to allow members to indulge in flights on the machine:—

"Gliding is a side of flight that is a little apt to be neglected at the present time, but it is a useful side nevertheless, and for the

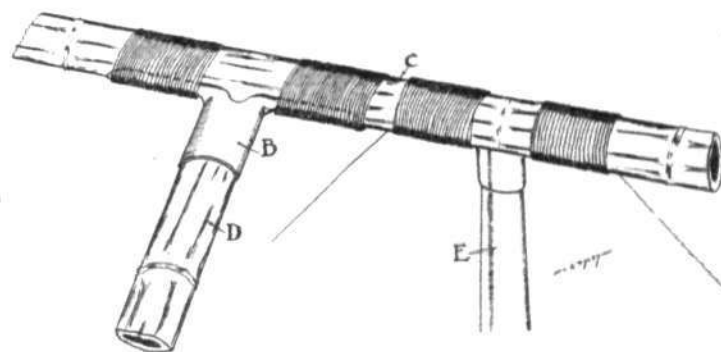
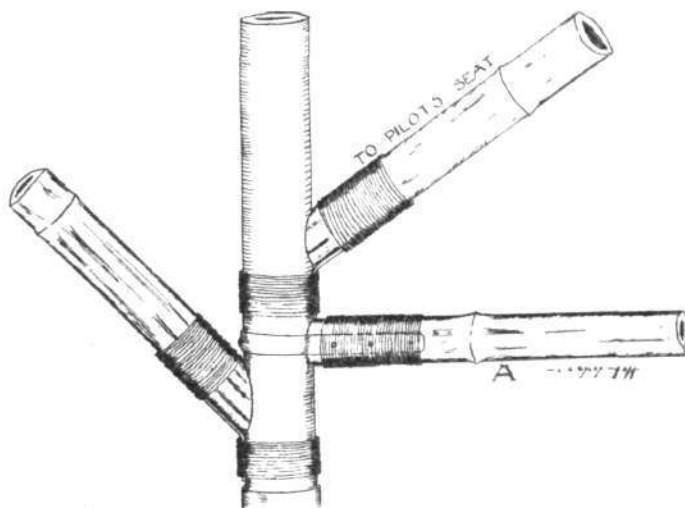
of mastery over the element which has so long defied conquest, added to the joyous exhilaration of the rush through the air, the delight of which has been compared to that of tobogganning. No doubt the chief problem in gliding is, to the town dweller especially, that of portability, and it was with a view to overcoming (to some extent) this obstacle that the writer constructed the machine shown in the accompanying scale drawings. The majority of model builders know how successful the 'canard' type of machine is, and as the Wright glider was also successful, it was decided to adopt something similar (for the first machine, at any rate), rather than run the risk of constructing something which might prove a failure. Bamboo is used for the main spars, outrigger, and ribs, whilst for the skids ash is employed. The stanchions between the planes as well as the compression struts connecting the front and rear spars, are of selected red deal, and to all appearances seem quite strong enough for the job. The strut lug was described in FLIGHT,



SOME CONSTRUCTIONAL DETAILS ON THE RYLEY GLIDER.—A. Sheet-steel fitting on which the elevator pivots. B. Steel pegs. C. Bamboo plugged and sawn down 3 ins. D. One-sixteenth inch diameter steel pegs. E. Sheet steel. F. Bamboo bound with twine and glued. Right: A simple tube joint connecting elevator, outrigger and landing skid. G. Bamboo outrigger. H. Steel tube socket. I. Ash skid. J. Section of ash skid.

advanced model builder and others similarly interested it should be very attractive. There are a great many individuals who cannot afford to run a motor-driven machine, and to whom the flying of models lacks that co-operation between man and machine which is really what they require; to such therefore does the glider appeal.

January 24th, 1914, whilst the remainder of the chief joints are shown in the diagrammatic sketches below. No doubt some readers will criticise the 'string and glue' joints, but it is really the only practical method of joining bamboo, and, if properly carried out, is quite strong enough; moreover, it enables several parts to 'give' slightly under certain circumstances, which otherwise might end in a broken spar. In the scale drawings a seat is shown, but after a few flights on the latter, I intend fitting a board and trying the prone position similar to the famous Wright Bros. early machines.



Left: Some sheet steel and twine joints in the chassis. A. Strut connecting skids. On the right is shown attachment of one of the elevator booms to upper front wing spar. B. Steel tube socket. C. Front spar. D. Detachable elevator boom. E. Inter-plane strut.

Just consider for a moment the points in its favour—practically most of the fascination of the motor-driven flight with all the charm of controlling a man-carrying aeroplane, and there is also that sense

"This position will certainly cut down the resistance considerably, and the author would be glad to hear from readers who have tried it."

Missing R.F.C. Officers.

WORD has now been received that Capt. Robert Boger, R.E., R.F.C., and Capt. Robin Grey are prisoners of war at Torgau. Lieut. T. Rawson-Shaw, R.F.A., R.F.C., has been notified as missing since October 27th.

Fatal Accident at Upavon.

It is with the deepest regret that we have to record a fatality which occurred at Upavon early on Thursday morning last. Flight Sub-Lieut. Murray, who was undergoing a course of instruction at the Central Flying School, was flying over Rushall Down, when the machine was wrecked apparently through the pilot, in the fog, mis-

judging the distance when coming down. A shepherd, who saw the smash, hurried to the spot, but found the pilot was already dead.

Fatality in Southampton Water.

ON Sunday last Mr. Victor Mahl was engaged testing a new waterplane over Southampton Water, when the machine suddenly dived into the water. Several boats hastened to the spot and the pilot was rescued, he having been able to cling to one of the upturned floats of the machine. Mr. R. Austen, who was a passenger on the machine, disappeared, and his body had not been recovered up to the time of going to press.

AEROPLANE TYPES.

THE GABARDINI MONOPLANE.

ONE of the most successful machines which have been produced in Italy is the Gabardini monoplane, many of which have been turned out from the works at Cameri, Novara. Although a first glance at the accompanying sketch plan and elevation gives one the impression that this machine is on Nieuport lines, it really differs from this latter make considerably, notably in the construction of the *fuselage*. The latter is constructed of steel tube reinforced with wood, forming a strong and light combination. The forward portion is rectangular in section from the nose carrying the engine—an 80 h.p. Gnome—to the rear of the pilot's and passenger's cockpit, where the lower *longerons* meet. From this point the remainder of the *fuselage* is of triangular section. This arrangement gives an excellent streamline form, and also allows plenty of room for engine, fuel tanks, control gear, and pilot and passenger. The triangular portion of the



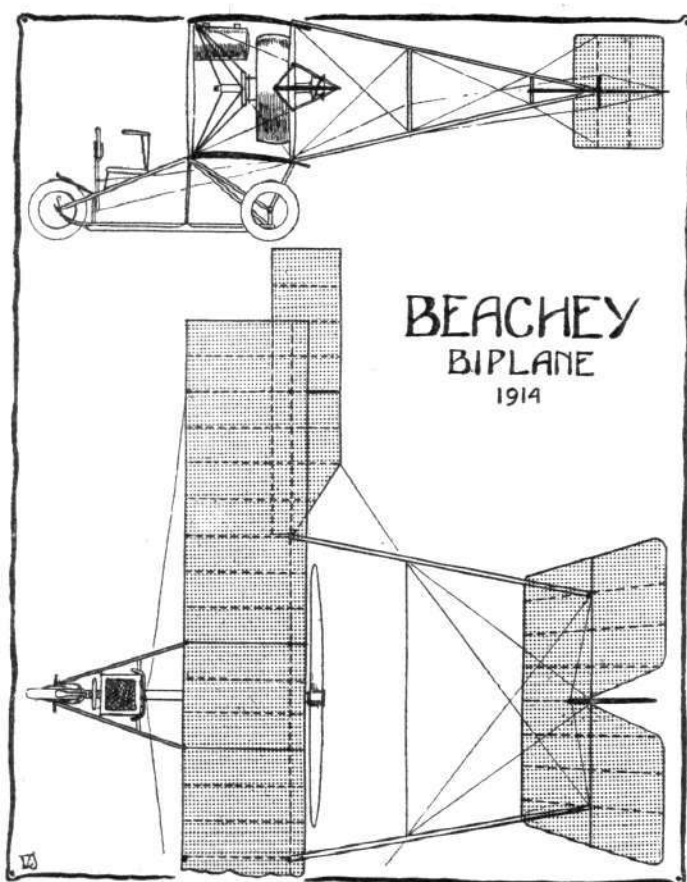
fuselage can be detached, thus greatly facilitating transport and housing.

The wings, which have a maximum camber of 190 mm., are built up on two main spars of tubular steel, upon which the ribs are loosely mounted so that they possess a certain amount of free movement when warping takes place. The ribs consist of single one-piece webs with top and bottom flanges. Holes are drilled in the webs of each rib for nearly the whole length, rendering the wing very light and strong. The *empennage* is somewhat unusual in that it is mounted well in advance of the vertical rudder, so that the latter has a wide range of movement. It consists of a fixed semicircular plane, with two similarly shaped elevator flaps hinged to the trailing edge. The fixed plane, elevators, and rudder are constructed of steel tubing. Lateral control is by wing

warping operated by a central lever, which also controls the elevators. The rudder is actuated by pedals. The chassis consists of two skids, upturned in front to protect the propeller, connected to the *fuselage* by three struts each. A tubular axle carrying a pair of running wheels is mounted on the skids by means of elastic bands. A hydro. model is also made, which differs from the land machine in dimensions and in the attachment of the two floats. The principal dimensions of the land model are as follows:—Span, 9 m.; supporting area, 18 sq. m.; overall length, 7 m.; weight, empty, 350 kgs.; useful load, 350 kgs.; speed, 65–135 k.p.h.

THE BEACHEY LOOPING BIPLANE.

ONE of the foremost exponents of looping the loop in the "States" is Lincoln Beachey, one of America's most daring stunt flyers. His first looping demonstrations were accomplished on a specially built Curtiss biplane



of 24 feet span, after which he used a small tractor biplane built for him by the Glenn L. Martin Co. He then collaborated with Mr. Warren Eaton, and produced the machine under notice, on which he has put up many successful looping demonstrations. The prominent feature of the Beachey biplane is its small size combined with high power, the main planes having a span of only 21 feet, whilst the engine fitted is an 80 h.p. Gnome *monosoupape*. In general appearance it resembles the Curtiss "headless" biplane, though it differs considerably in detail. The main planes are built up in three panel-sections, one in the centre 3 feet in span, and two outer ones of 9 feet. Each plane is built up on two main spars, the front one of D-section forming the leading edge being $1\frac{1}{2}$ ins. by $1\frac{1}{4}$ ins., and the rear one close to the trailing edge measuring $1\frac{1}{2}$ ins. by $1\frac{1}{4}$ ins. The

spruce ribs and front and rear spars are laminated, the former horizontally, and the latter vertically. The wing section has a maximum camber of $1\frac{1}{2}$ ins. about 1 ft. 6 ins. from the leading edge. Six pairs of struts separate the top and bottom planes, and the outer sections are easily and quickly dismantled and assembled. Pivoted to the two rear outer struts of the main planes are the *ailerons* for maintaining lateral control. They are interconnected so that when one goes up the other goes down, and each has an area of about 13 sq. ft. The engine is centrally mounted midway between the top and bottom planes, and drives direct a 7 ft. 9 ins. diameter

propeller situated at the rear of the main planes. The tail consists of a fixed stabilizing plane carried by two pairs of V outriggers, with two elevator flaps hinged to the trailing edge; a partially balanced vertical rudder is mounted between the elevators. The landing chassis is absolutely rigid, the necessary resiliency being obtained from the 4-inch tyres of the three 20-inch wheels. The principal dimensions of this machine are:—Span 21 ft. (over *ailerons* 25 ft.); length 18 ft. 4 ins.; chord 3 ft. 6 ins.; gap, 3 ft. 9 ins.; supporting area 147 sq. ft.; weight in flying order 773 lbs.; speed 84 m.p.h.; climbing speed 1,125 ft. per min. "VEE JAY."

THE LANG PITCHFINDER.

PROPELLER manufacture is now a specialised branch of the aeronautical industry because it is realised that, for the attainment of the highest efficiency, it is essential that some form of systematic and continuous experiment and observation should be adopted, not only in the works, but also on the machines to which the airscrews are fitted. The direct result of this has been that different makers have adopted some special form or shape of blade which has become characteristic of a particular maker, and for which certain merits are claimed.

The system of manufacture adopted in the works of the Lang Propeller, Ltd., has already been

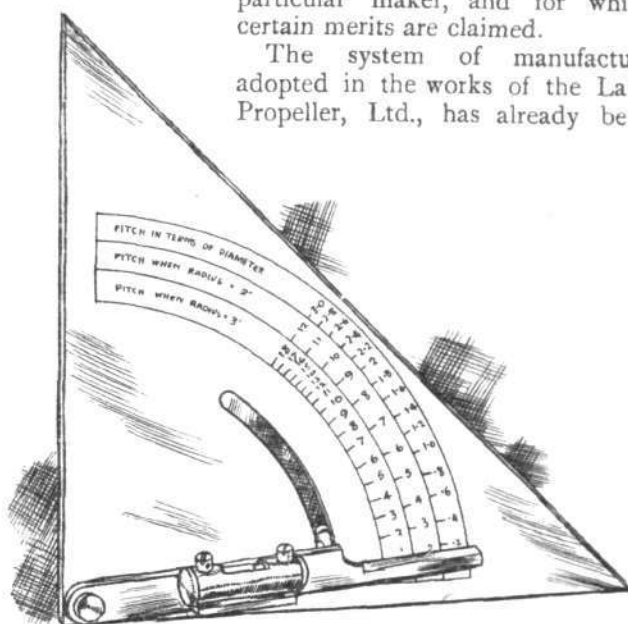


Fig. 1.—The Lang pitch-finder.

described in these pages (see *FLIGHT*, August 2nd, 1913), but an instrument which is employed to ensure that the face of the blade is set at the correct angles at different radii is of interest, and is shown in the accompanying illustrations. It may, however, be mentioned that its usefulness is not confined to the workshop, as it can be made to be of great service in checking the blade angles of airscrews after they have been in use for some time, to see whether or not the stressing of the blade and atmospheric influences have caused the distortion of the propeller, as

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The Lights of London.

THE old order having expired, the Commissioner of Metropolitan Police on Monday issued a new order regulating the lighting of London. This, in the main, embraces the regulations which have been previously issued, and unless sooner revoked, it will remain in force until January 1st, 1915.

Aeroplanes, &c., as Contraband.

IN the revised lists of contraband of war, published

such might be attended with disastrous results upon the efficiency.

The pitch-finder consists of a brass 45° set square, to which a spirit level with a radial index arm is attached. This spirit level is hinged near the base of the instrument, so that the index arm moves over a suitably graduated scale, and means are provided for locking it in any desired position. The graduations give, as shown, the chord pitch in terms of the diameter and the chord pitch at various radii, so that by placing the instrument along the chord of the aerofoil forming the blade, at a known distance from the axis of rotation, when the airscrew is arranged with this axis vertical, and moving the spirit level until the bubble rests in the centre of the tube, the



Fig. 2.—Method of applying the pitch-finder to the blade of a Lang airscrew during manufacture.

chord pitch in terms of the diameter can be immediately read off the scale, while when the pitchfinder is applied at the two definite radii for which the instrument is graduated, the chord pitch is measured directly.

The simplicity of the instrument, both as regards its construction and the manner in which it is used, causes it to be of value to the aeroplane constructor, as well as to the propeller manufacturer, and it is deserving of a still more extensive employment than it has at present.

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in the *London Gazette* of the 29th ult., are the following as absolute contraband:—

"Aeroplanes, airships, balloons, and air craft of all kinds, and their component parts, together with accessories and articles recognisable as intended for use in connection with balloons and aircraft.

"Motor vehicles of all kinds and their component parts.

"Motor tyres; rubber.

"Mineral oils and motor spirit, except lubricating oils.

Lubricants and fuel other than minerals are scheduled as conditional contraband.

AIRCRAFT AND THE WAR.

Writing to the *Daily Mail* on Wednesday of last week regarding the bombardment of the German right, Mr. G. Ward Price, said:—

"On their right the British naval flotilla is pounding them with heavy guns—and airmen who have flown over their lines tell us that the German positions during the bombardment are a tolerable imitation of hell, all flames and smoke."

In a message from Hazebrouck on the same date, Mr. John Prioleau said:—

"A German aeroplane buzzed and hovered in the dusk over the camp. At once the air was rent with the spluttering crackle of rifle fire. Every rifle was emptied again and again at the spidery thing hanging overhead, with death and destruction poised in its talons. Eye-witnesses were wondering whether any of the shots had taken effect when with a fierce whirr two British biplanes swooped up and gave chase to the enemy. A thrilling quarter of an hour followed, when all eyes were glued to the three elusive mosquito-like craft as they circled, rose and sank around one another in the crystal evening air. Then the first of ours drew ahead and closed up slowly but surely with the fleeing German. Suddenly a tiny ripping sound, rather like a child's rattle heard a long way off, came down and the German machine dipped exactly as a hit partridge swerves. He kept gamely on, but there could be only one end. Lower and lower he dropped, the Englishman poised above him. Lower and lower—that was the last my informants saw of them, two little specks sharply pencilled against the rosy dusk, one above the other, dropping, dropping earthwards as they faded out of sight behind the little hillocks to the north."

"'Winged the beggar all right,' said a Tommy with as much emotion as if he were watching covert shooting. It was the third Taube that had made its appearance in twenty-four hours. Yesterday one dropped his bomb but missed his mark (a railway station) by a generous margin, and this morning another managed to do an insignificant amount of harm."

Another *Daily Mail* correspondent, writing from Copenhagen, said:—

"I learn from Düsseldorf that the British aerial bomb recently dropped on the Zeppelin shed set fire to it and that an airship was totally destroyed. One airman was killed and three were seriously burned."

Mr. George Renwick, the *Daily Chronicle* correspondent, on the 28th ult. wired from Hazebrouck:—

"The enemy's aeroplanes are active in this neighbourhood. Yesterday and to-day 'Taubes' have paid visits to Hazebrouck, and have been dropping bombs. The first two instalments—three in all—did not kill or injure anyone and achieved no great material damage. The airmen's efforts were evidently directed against the railway line, but their attempts to interrupt communication failed. All the bombs fell 'wide.' A little more than an hour ago I saw a third German aeroplane pass over the town, flying at a considerable height. No bombs were thrown from it, and for more than five minutes it had to 'run the gauntlet,' hundreds of shots being sent up after it. It was, however, too high up for the fire to be effective. Some time previously it had been observed by British airman, and an aeroplane had started in pursuit. As they passed over the town both were going full speed ahead, and in the gathering twilight it was possible to note that the British craft was gaining."

"As I watched through my glasses I heard a faint rattle; the pursuer had got within range of the 'Taube' and was firing upon it. The German airship seemed to shudder for a moment, slacken speed and, like a winged bird, skim downwards. But then the twilight and the distance swallowed up pursuer and pursued, though I think that there could be no doubt as to the result of the encounter. No sooner had the two aircraft disappeared than a bomb fell about a hundred yards from where I was standing. The 'Taube' from which it was thrown was travelling above the clouds and could not be seen. Again no damage was done."

German aviators made unsuccessful attempts to approach Paris on the 28th ult. The raid was prevented through the vigilance of the French pilots policing the Paris area, who headed them off. It is stated that the raiders, using Taube and Aviatik machines, came from the regions of Compiègne and Senlis, and bombs were thrown at the former place.

The German "wireless" news sent out from Berlin on

the 29th ult. contained the following item, of which there has been no confirmation from the Russian side:—

"German airships flew over Warsaw and dropped bombs on the railway station there, which was destroyed by fire."

From the North of France, Mr. Ernest Macfarren telegraphed on the 29th ult. to the *Daily Mail*:—

"Two German aeroplanes flew over the north of France yesterday and dropped two bombs at Béthune. The first did not explode, but the second fell among a group of women in the market place, 19 being killed and 40 injured."

The following extract is from a letter written to his brother at Doncaster by Mr. Harold Blackburn, who is now on active service:—

"My two chases after the German aeroplanes were quite exciting, and I'm just longing for another chance. I was very lucky in getting a long reconnaissance on Wednesday—three hours and five minutes, and covering about 140 miles—locating the German reserves. A Taube machine came over a few minutes ago—the second one I have seen near the camp—but he disappeared without coming nearer than about four miles, and it was just dusk. Last night, after writing the above, another Taube came over, and we witnessed a splendid running fight for several miles. You should have seen the circling and daring and manoeuvring for firing positions. It was awfully exciting. We could hear the shots, and expected one of the craft to come down any minute, but they disappeared, still fighting. The captain returned in about twenty minutes with three of his wing spars shot through, saying, 'The German escaped,' but we heard late last night that a German machine had come down in flames a few miles away—doubtless the same one."

"I flew over — yesterday during a two hours' flight, and the town seems to be evacuated and partly on fire. It's a big manufacturing town, and the strangest sight on earth to see a place like that deserted."

Writing to the *Daily Mail* from the "North of France" on Friday last, Mr. Basil Clarke, said:—

"The French airmen from their base near Dunkirk have made reprisals on the German bomb-throwers. An air team of six biplanes and two monoplanes soared into the sky at midday and disappeared south and east. They had located the house (near Dixmude) wherein the German headquarters staff had established themselves after being driven pell mell by our naval gunfire from a big house near the coast. This new headquarters was a chateau lying in pleasantly wooded grounds—and the German staff, it is whispered, have been 'doing themselves very well' there. The aeroplane team between them carried 240 bombs. They did not seek out women and children or let fall their missiles in public market places—the German aeroplanists' favourite form of murder. They flew one after another over the chateau and let fall bomb after bomb. Before half a dozen had fallen on the place the chateau roof was split, slates and masonry were hurled about, and the place was in flames. The 'staff' pelted out of doors and hid in the woods. The remaining aeroplanists therefore let fall their bombs among the woods. The whole team returned safe to Dunkirk in the evening."

On the same day a *Daily Telegraph* correspondent wrote from Boulogne:—

"As I travel in the train en route for London I learn from a gentleman who has just left Dunkirk that a German aeroplane flew over that town late last evening. The Taube threw two bombs: the first fell on a house in the Rue du Collège, and the second in the Rue Faulconnier. In the first case the bomb fell right through the roof and two top floors, and exploded on the ground floor, causing all the windows of the district to be smashed. The other fell in the Rue Faulconnier, a few yards from an ambulance. Two persons were killed and three injured. The same gentleman informs me that a Taube—presumably the same—flew over St. Omer this morning at midday. It came from the direction of Béthune and Aire-sur-la-Lys. The machine was flying very low, and threw no missile on the town of St. Omer. Two English aeroplanes immediately went up and gave chase to the enemy's Taube. Shots were exchanged, and my informant—who is an official—informing me that one of the occupants of the Taube was injured. The machine made off towards Calais, followed by one of the Englishmen. Calais was given the alarm, and the Taube was brought down near Andruick by the aeroplane that had left Calais. The inhabitants of St. Omer were exceedingly interested in the proceedings, and showed no sign of panic."

Advices from Amsterdam give the information that on the 29th ult. British aviators dropped bombs into the

station square at Lichtvelde, where a considerable quantity of war material was heaped, and much damage was done. Three Germans were killed.

In the official "wireless" news sent out from Berlin on October 30th were the following items, neither of which have been confirmed up to the time of going to press:—

"A Zeppelin is reported to have flown over Paris on Wednesday, dropping bombs, which did great damage. According to the *Frankfurter Zeitung*, eight persons were killed and many injured. French airmen endeavoured in vain to attack the German aircraft.

"The inhabitants of London are leaving the capital for Scotland through fear of German airships."

From Flushing it was reported that on Saturday afternoon at four o'clock an aeroplane was seen at Breskens dropping bombs, notwithstanding that a Taube was pursuing it. Both disappeared in a south-westerly direction. Shortly afterwards five aeroplanes came into sight.

The following is an extract from an officer in the Royal Field Artillery:—

"A German aeroplane was brought down quite near us yesterday. It landed easily. The men were captured, the engine removed, and the rest burnt. We've seen a good few German planes, but many more of the Allies' ones. It is a helpless feeling to see a plane a great height up observing you and know he can't be touched except with a lucky shot from a special gun."

According to a *Daily Mail* correspondent, writing from "Belgium" on Saturday, with regard to the operations in the Dixmude and Ypres districts:—

"The German aeroplanes have been very busy in this district during the past four days. On Thursday they dropped five bombs on Ypres, seriously wounding two women and slightly wounding a French officer. Elsewhere only material damage has been done."

Another correspondent in a message from Calais, dated Sunday, said:—

"When the history of this war comes to be written the British airman will no doubt receive his just due; for the moment he is the most handicapped and criticised unit in the field. A mistake by him is so vital. As if dozens of shells bursting around him, and thousands of bullets whizzing by, were not enough to put him off his work, the enemy has now started poisoning him as he sails through space 7,000 and 8,000 feet up. Latterly our airmen have noticed a strange rainbow effect in the bursting shell cloud—green, yellow, and even black, besides the ordinary white. And on coming to earth our flyers have complained of dizziness and sickness. Death sealed the lips of two who fell for no apparent reason."

A special correspondent of the *Standard*, writing under date of October 31st, from "Near the Belgian Coast," said:—

"German aeroplanes have been busy this week throughout this district. Many bombs have been dropped, but very little damage has been done. The Allies' airmen are more than a match for the German."

"A British aviator said to me yesterday: 'The most trying part of our work is something that would never occur to you. We don't mind the chances of a bullet hitting us. A fight with an enemy's aeroplane is fine sport, and the Germans cannot lick us at that. But when they get their high-angle guns at work on us the disturbance of the air is so great that it is as much as ever you can do to control your machine. It plunges up and down and rolls sideways so that, do what you will, it nearly turns over. You hardly know whether you are upside-down or not. I've been in plenty of bad weather at sea, and it's worse than anything I ever suffered in a boat. It makes me downright sick, just like a bad attack of sea-sickness.'"

The following details regarding an aerial engagement on the east of Amiens were telegraphed from Paris on Sunday by the Central News:—

"Captain Moris, returning from a reconnaissance which had lasted five hours, went in pursuit of a Taube. Shortly afterwards a second Taube appeared, and another French aeroplane, piloted by Captain de Verniettes, with Sergeant Gilbert as passenger, entered the fray. There was a sharp exchange of shots, which ended in one of the German machines being damaged by the French fire and falling in its own lines."

A *Daily Mail* correspondent thus describes an incident which occurred at Thielt on Sunday:—

"The Kaiser unfortunately missed by a quarter of an hour a splendid exhibition of bomb-throwing by a British airman, because fifteen minutes after he had departed a British monoplane appeared above the town. It circled around for about an hour. The airmen dropped six or eight bombs, some of them with terrible result. Most of them fell round the market-place. The town hall and the Palace of Justice were hit and damaged considerably. Three bombs exploded in the market-place, killing two German soldiers. So great was the concussion that a large number of windows were smashed. The population were not greatly alarmed. My informant stated they had a previous experience of bomb-throwing from a Zeppelin a month or two ago."

From Mr. Alan Bott, the special correspondent of the *Daily Chronicle*, the following message from "Lake Constance" was received in London on the 2nd inst.:—

"'Zeppelinmania' has led to a great deal of exaggeration. The statement that the new Zeppelins, said to be destined for a raid on London, have aluminium covers as a protection for the envelope against bombs and shells is incorrect. In regard to the two airships now completing at Friedrichshafen, I learn that several experiments have been made with various substances, but so far these efforts to make the Zeppelins bomb-proof have been unsuccessful. If Count Zeppelin persists in his determination to find a suitable cover, his new treasures at Friedrichshafen may not be ready for another three or four weeks."

Dealing with a parade of Belgian and French troops before King Albert and President Poincaré at Furnes, on Monday, a *Morning Post* correspondent said:—

"Shortly before nine, as the town square awaited its guests, a more rude reminder came. A Taube, eluding our air scouts and soaring over the town at a great height, dropped a bomb. It missed the square, and spent its murderous rage harmlessly on a building near the railway station. Not a soldier in the ranks flinched. The parade calmly waited."

The following incident was reported by a *Daily Mail* correspondent on Monday:—

"Another air-fight, very characteristic of the fighting qualities of the British, and indeed German, airmen occurred in recent fighting round Ypres. Two British aeroplanes went in pursuit of a Taube that was both reconnoitring and throwing bombs. Our men were armed with carbines and saloon pistols. After some manoeuvring they succeeded in putting a bullet through the petrol tank of the Taube. In spite of this the Germans managed to plane successfully to the ground; and leaving their machine they ran to a wood some two miles off. The hue-and-cry was raised, and fifty or more British and Belgians hurried to the search. The game of hide-and-seek lasted long, but after an hour or so a Belgian soldier spied the foot of one of the Germans, who had wriggled up a drain. The other man also was captured a few minutes later. Both men wore the Iron Cross, and the captors were very disappointed at not being allowed to take them as mementoes. 'He burned my house down at Liège; why shouldn't I have his Iron Cross?' was the Belgian argument. The two airmen, who were very fine men, had one consolation in captivity: they would be able to grow some hair. When taken their heads were shaved as bald as a razor could make them."

The *Morning Post* correspondent at Cettinje wired on Nov. 2nd:—

"A number of Austrian aeroplanes yesterday threw bombs on Antivari, which was also the object of attack by the enemy's Maxims. About a dozen bombs were aimed at a French transport which had arrived at the port with munitions under the escort of three torpedo boats, but fortunately without effect. Twenty bombs fell near the palace and the Prefecture, and some Italian buildings, the latter being partially damaged. The Royal yacht was also the object of attack, but the bomb fell at the side of the vessel. In no case was there any loss of life. French and Montenegrin artillery was directed against the aeroplanes, but the latter had ascended to too great a height for any result to be attained."

In a *communiqué* issued by the Belgian Government on November 2nd, it was stated that the Russians had captured an aviation park from the retreating Germans in Poland.

In a message to the *Daily Mail* from the north of France on Tuesday, Mr. G. Ward Price said:—

"An important aerial reconnaissance was carried out to-day by Belgian airmen. Exact details are wanting, but it appears that they were able to observe in the German lines a distinct movement of retreat in the direction of Brussels."

Another message stated :—

"Two German aeroplanes have been brought down recently in the neighbourhood of Ypres, and only yesterday there was a sharp encounter in the air in the vicinity of Poperinghe between a German and two British machines. The hostile craft was driven off."

The following appeared in *The Times* of the 2nd inst. :—

"The description in German newspapers of the bravery of one of the crew of a Zeppelin contains some interesting details. It is said that the same ship with the same crew took part in the bombardment of Liège, Namur, and Antwerp. During one of its last cruises the airship came within the range of a searchlight and was at once exposed to heavy fire. A shell smashed the framework of one of the screws, and the screw was so bent that it endangered the motors. At the same time the envelope was badly torn, and thus caused great resistance to the wind. An engineer named Luickhardt succeeded in climbing along outside the ship and repairing all the damage."

Writing from the Belgian-Dutch frontier on Tuesday a *Morning Post* correspondent said :—

"The enemy has lost very heavily in horses, and successful aeroplane operations carried out by the Allies have involved the

destruction of a considerable quantity of stores and material at one of their bases."

In a message from Rotterdam on Tuesday to the *Daily Mail* Mr. James Dunn said :—

"Two German sailors guarding a petrol tank at Bruges were killed yesterday by a bomb from a British aeroplane. The British aeroplanes are as thick as swallows in the neighbourhood of Bruges. They are watching the movements of the Germans, and frequently drop bombs on railway wagons and transports."

An official announcement was made in Paris on Wednesday to the effect that three German aeroplanes were shot down in the region of Souain on Monday.

A *Morning Post* correspondent who was in Amiens recently wrote :—

"Beyond heavy tribute the Germans did no actual damage to property, and the magnificent cathedral is intact, but lately there have been daily air raids. The other day I watched an "Aviatik" drop three bombs, which injured a few people, but there was not the smallest fuss made about the incident."



N.P.L. EXECUTIVE COMMITTEE REPORT.

READERS of *FLIGHT* do not need reminding of the extensive work that has been carried out at the National Physical Laboratory at Teddington in connection with aeronautics—the results of which have proved to be of incalculable value to the industry, and contributed in no small measure to the position which we now hold relative to other countries. But it is seldom realised that research in this particular direction constitutes only one small section of the work upon which the Staff are engaged at the Laboratory. Speaking generally, one may say that the problems which the Staff are called upon to investigate from time to time, cover practically every branch of experimental physical science—a fact which is emphasised by a perusal of the recently issued report of the Executive Committee for the period from January 1st, 1913, to March 31st, 1914—while the testing of instruments, etc., forms a not inconsiderable proportion of the work done.

This report summarises the work already done in the several departments of the Laboratory during the period mentioned; and indicates the general scope of the research approved for the year 1914-15. So far as aeronautics is concerned the work recorded as completed is that which has been already published in the Advisory Committee's Report for 1912-13; but during the year 1914-15 it is proposed, amongst other items, to continue the investigations into the forces and moments acting on aeroplanes and the application of the results obtained to the problem of stability; to determine the resistance of various parts of an aeroplane, including the measurement of the lateral force on propellers when inclined to the wind; and to photograph the motion of model aeroplanes in free flight in order to

illustrate the mathematical principles of stability. Attempts will also be made to determine the pressure distribution round a propeller blade under working conditions. In the Department of Metallurgy, experimental work in connection with light alloys for use in aeronautical work will receive attention, and a new rolling mill is now in course of erection for use in these experiments.

Included in the Report is a list of papers which have been written by members of the Staff in the course of the years 1912-13 and 1913-14, and which have been published either officially by the Laboratory or communicated to scientific societies and institutions or to technical journals. This list forms an interesting commentary upon the diverse character of the work done at the Laboratory.

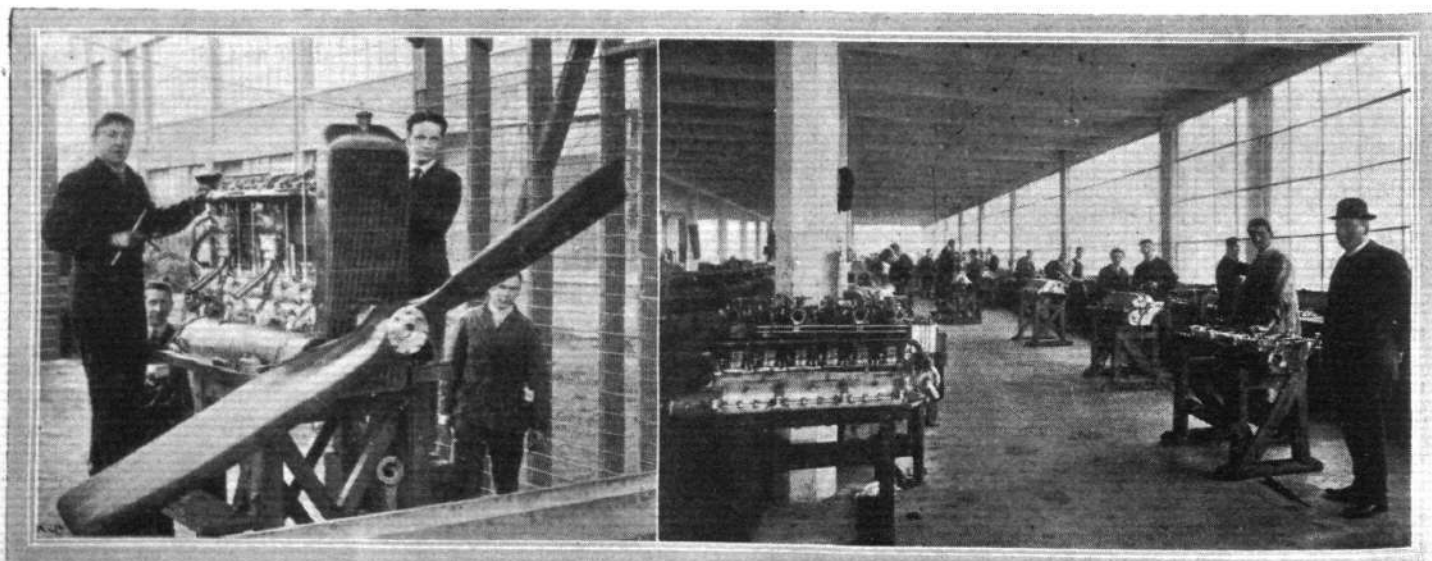
Some of these papers have been reprinted by the Executive Committee, and form Vol. XI of the well-known and valuable series of Collected Researches. As being specially of interest to the student of aeronautics, we may mention the following papers :—

"Methods and Apparatus used in Petroleum Testing." Part II. Viscosity. By W. F. Higgins, A.R.C.Sc., B.Sc.

"The Tenacity, Deformation and Fracture of Soft Steel at High Temperatures." By Walter Rosenhain, B.A., D.Sc., F.R.S., and J. C. W. Humfrey, B.A., M.Sc.

"The Intercrystalline Cohesion of Metals" (Second Paper). By Walter Rosenhain, B.A., D.Sc., F.R.S., and Donald Ewen, M.Sc.

"Similarity of Motion in Relation to the Surface Friction of Fluids." By T. E. Stanton, D.Sc., F.R.S., M.Inst.C.E., and J. R. Pannell.



THE AERO ENGINE DEPARTMENT AT MESSRS. ARROL-JOHNSTON, LTD., DUMFRIES.—In our photograph is seen, on the left, one of the Beardmore aero engines assembled ready for testing, and on the right, a part of the Company's aero department, where they are manufacturing these motors for active work.

Models

Edited by V. E. JOHNSON, M.A.

Model Aeronautics in America.

AN extremely interesting account of model flying in America reaches us from Mr. W. P. Dean, writing from Detroit, Michigan, U.S.A., the chief points of which are embodied in the following:—At the present time we gather that the leading model club in America is the Aero Science Club of America, a club which was formerly known as the New York Model Aero Club, a club with respect to which an account was given some time ago in FLIGHT. Three and a half years ago Mr. Dean left Manchester for the United States, and in the September 11th, 1914, issue of FLIGHT an illustration was given showing a number of models made by Mr. Dean from May to October, 1911, at Schenectady, N.Y. "These models are now," says our correspondent, "somewhat out of date, my latest efforts having been connected with model flying boats. After a most interesting correspondence with Mr. Harry Schultz, Model Editor of (American) *Aeronautics*, during the winter of 1913 and 1914, I became known amongst the New York model flyers as one of England's pioneer model workers. In May I received a pressing invitation to go down to New York, and I became the guest of Mr. Edward Durant, Director of the Aeronautical Bureau and Aero Science Club, and a member of the Aeronautical Society. I spent three days amongst them, and all the members of the club were very pleased to have me amongst them, and my advice and experience of English model construction work were very acceptable to them. If any of the leading English prize winners ever visit New York, I can assure you they will be well received by the Aero Science Club, as they have closely followed their progress and are familiar with their names.

"I witnessed some excellent and consistent flights in the contest of May 30th, 1914, of which I enclose you a cutting" [reproduced below]. "My chief efforts for this contest were centred upon a single-propeller r.o.g. model similar to the English 'Evans' type, with duplex gear, 9½ ins. propeller. The gear I bought in England three years previously. In my final 'wind up' for duration, after getting my planes adjusted to correct position, one of the gear wheels stripped its shaft, which forced me to alter it to a single strand motor on the spot, thus reducing my duration more than one half, owing to the fact that my fixed, rubber anchor then warped the fuselage and I dare not give anything like the full

number of turns. My competitors, however, were genuine in their regret at my misfortunes, as I also had to repair up my hand-launched model. You will note their very considerate report to the *New York Times*. Mr. Durant some years ago invented the measuring wheel for model flights. I can assure you the flights of all the competitors were accurately timed, and I would like to see the names of these competitors and Mr. Durant's recorded in FLIGHT. Their r.o.g. machines rose on rough, fine shingle footpaths quite easily, many fitted only with small brass-bushed wooden ¾-in. disc wheels. My own and Mr. Harry Schultz's had cork wheels, brass-bushed, 1.25 ins. in diameter. A picture of the r.o.g. competitors was taken by the Animated Picture Co. of New York, and I saw later on the flights of some of the machines thrown upon the screen in animated picture shows. The names of the model flyers sent are well deserving of being placed on record, as their efforts in different contests during the last two or three years have been very successful. Mr. Charles V. Obst, in July, 1913, held the record of 30 secs. duration for a single propeller hydro-aeroplane, 4.5 oz. weight. Again, in 1913 his r.o.g. single-tractor machine (a fast and steady flier in windy weather) had a 40 secs. duration. He also holds a contest record of 18.8 secs. duration for a flying boat. This machine rises off the water after a run of some 10 ft., and is a very stable flyer. Again, on July 30th, 1914, Mr. Obst won first prize in a hydro. contest, with a flight of 28 secs., at the Union Course Pond, Woodhaven L.I., New York, the second prize being won by Mr. D. Crisendi with 26 secs. Mr. R. Funk holds the record for r.o.g. models with a flight of 1,620 ft., February, 1914, twin-screw models. He also holds the record for single-tractor, hand-launched, October, 1913.

"Mr. L. Bamberger has a distance record of 1,542 ft., and in the contest I participated in he won the first prize with a duration flight of 107 secs. I may mention here that when high winds prevail duration only is recorded in these contests. Mr. Bamberger has promised me drawings and full particulars of his model, which certainly proved a most excellent flyer and a good climber. Mr. Harry Schultz has gained several American records, and has taken a keen friendly interest in me. He has for a long time posted the English FLIGHT to me on loan, and would not allow me to defray his postage on them. He is an excellent designer and model editor, and makes a new model for every contest.



The Aero Science Club of America—a club formed from some of the original younger members (now adults) of the New York Model Aero Club—gathered together for their r.o.g. competition on Decoration Day, May 30th last. On the left is Mr. Edward Durant, Director of the Club; on the right the cinema camera used to record the club model flights, which films have been produced all over the United States.

"I saw Mr. Harry Herzog's model loop the loop several times very nicely when I was at the New York contest. When it first made its appearance it won first prize as a twin tractor hydro at the Oakwood Heights contest, winning first prize with a flight of 28½ secs., this being then understood as a world's record for models of this type."

Mr. Dean also encloses a recent letter to him from Mr. Schultz (the Secretary of the Aero Science Club), from which we reproduce the following, which will, without a doubt, interest many of our model flyers. It has reference to a "speed contest"—a form of competition which has been suggested more than once in England at various K. and M.A.A. council meetings:—

"The speed contest was run off, and was one of the best contests I entered in a good while. The course was run over 528 ft., or one-tenth of a mile. It was won by Mr. Funk with a flight of 14 secs. for the course. I came second with a flight of 16 secs. While I do not like to brag, I desire to state—and my views are entertained by the others present—that my model was really much faster than Funk's, but owing to the fact that it positively refused to fly straight, in spite of my strenuous efforts to get it to do so, I was compelled to be satisfied with the flight of 16 secs., which, by the way, was a semi-circular one, and not straight as was Funk's. This has rather prejudiced me against headless type models. They are very fast fliers (a fact which I clearly demonstrated), but they are very erratic, that is, they do not possess the amount of stability as do the elevator models, nor will they fly as straight. Mr. Funk tells me that his model was originally one of that type, but after testing it out he immediately changed. Lucky for him! We had about 25 entrants in that contest, and the flights were witnessed by about one thousand people. We had circulars given out on the field, and have had a number of inquiries from persons who desire to join the club. Advertising pays!"

"By the way, we had a gentleman from the Aeronautical Society call at our meeting last Saturday, and he became so enthusiastic that he offered \$10.00 prizes for a model glider contest, and he promised that the Aeronautical Society would offer at least \$50.00 more. The present outlook is very sunny."

The following cutting, also sent us by Mr. Dean, is taken from the *New York Times* of May 31st, 1914:—

"Flying Model Aeroplanes."

"Flying of model aeroplanes under the auspices of the Aero Science Club at Rugby Park, Brooklyn, yesterday, attracted a considerable crowd interested in this phase of aeronautics. High winds and generally unfavourable weather conditions handicapped the early flights, in which William P. Dean, one of England's most enthusiastic supporters of this sport, was a sufferer, as he had the misfortune to wreck his models in the preliminary tests."

"In the hand-launched model test L. Bamberger was winner of the first prize, with a flight of 107 seconds. The other winners, with times of flights in seconds, were: R. Funk, 84½; F. Watkins, 72½; C. Freelen, 67½; A. K. Barker, 67; F. Broomfield, 57½; C. V. Obst, 50; and W. P. Dean, 35½."

"In rising from the ground contests, first prize was won by Fred Watkins with a flight of 75½ seconds. The other prize-winners were: W. Bamberger, 70 seconds; Harry Schultz, 63½; A. K. Barker, 61½; G. A. Cavanaugh, 51; L. Bamberger, 43½; and W. P. Dean, 27. Edward Durant, of the Aeronautical Society, and E. H. Unkles, of the Aeronautical Bureau, acted as judges at the contests."

Mr. H. Gilbert's Model Orthopter.

In our issue of October 9th last (page 1028) an account was given of the above model. We have received from Mr. Gilbert a communication with reference to this account and certain queries inserted therein. "I notice," writes Mr. Gilbert, "you question mark *re* 'clockwork motor.' I applied the term because the flapping mechanism contains a train of wheels, viz., a pinion and toothed wheel, but instead of being driven by a steel spring it is driven by skeins of rubber. Since writing last, as the result of a number of flights, I have arrived at the following conclusions: I have been unable to improve the duration of 12 secs., and I am therefore designing and building another complete model. I intend to give the wings a greater amplitude, which will be obtained by making the connecting-rods longer than on the former motor. I intend also to increase the size of the gearing so as to obtain, if possible, a longer duration. The chief trouble with the last model was with the motor and the wing tips getting broken. Owing to lack of requisite hardness in the bearings, the pinion holes wore away somewhat rapidly, and after a number of flights caused the wheels to jump and miss, thereby losing a lot of power. In my new model I am using deeper cut toothed wheels and pinion. With respect to the wing tips, the chief reason for them getting damaged and smashed so often was because they were made very thin so as to be flexible, and as the wing tips always hit the ground first they are always the most likely to be damaged. I intend making

them of piano wire in my new model, and the problem to be solved is the necessity of using some kind of spring for the impulse stroke. It is a great drawback, because it necessitates a great deal more power in order to be able to overcome it, and in my opinion this will be a great bugbear in the case of models. There is certainly an opportunity here for some model firm to produce a good orthopter motor, which, if really efficient, would, I think, command a ready sale."

I notice on page 1029, line 2, a misprint, viz., 3 ins. should read 3 ft.



KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Single screw, hand-launched	Duration ...	J. E. Louch	...	95 secs.
	Distance ...	R. Lucas	...	590 yards.
Twin screw, do. ...	Duration ...	T. D. Collingwood	...	145 secs.
		Chown	...	290 yards.
Single screw, rise off ground	Duration ...	W. E. Evans	...	68 secs.
	Distance ...	J. E. Louch	...	365 yards.
Twin screw, do. ...	Duration ...	L. H. Slatter	...	2 mins. 49 secs.
	Distance ...	J. E. Louch	...	266 yards.
Single-tractor screw, hand-launched	Duration ...	C. C. Dutton	...	91 secs.
	Distance ...	J. E. Louch	...	190 yards.
Do., off-ground	Duration ...	C. C. Dutton	...	94 secs.
	Distance ...	J. E. Louch	...	35 secs.
Single screw hydro., off-water	Duration ...	L. H. Slatter	...	29 secs.
Single-tractor, do., do.	Duration ...	C. C. Dutton	...	65 secs.
Twin screw, do., do.	Duration ...	S. C. Herson	...	51 secs.
Engine driven off grass	Duration ...	D. Stanger	...	

Notices.—A competition for compressed air models will be held on Wimbledon Common on Saturday, the 14th inst. Entrance fee of 1s. 6d. each model to be paid on the ground, and to be divided as follows:—Two-thirds of total amount received as first prize, and one-third as second prize. In this competition, which starts at 2.30 sharp, there will be no loading limit or other regulations limiting the construction of the models, and marks will be given for actual seconds the model is in flight.

All communications regarding models should be addressed to H. A. Lyche, 46, Templesheen Road, East Sheen, S.W.

AFFILIATED MODEL CLUBS DIARY.

Club reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Leytonstone and District Ae.C. (14, LEYTONSTONE RD., STRATFORD)

Nov. 8th, flying on Wanstead Flats, near sand hills. B Section competition for single-screw tractors, hand-launched, at 10.30 a.m. prompt. A Section competition for twin-screw tractors, r.o.g., at 11.30 prompt. If wet meet at club room. Owing to a mistake in date, assistant sec. apologises for not sending in monthly report.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

Nov. 7th, monthly club competition. Models to be single-propeller or tractor models. Average of three flights for duration. Prizes value 7s. 6d.

Sheffield Ae.C. (41, CONISTON ROAD, ABBEYDALE, SHEFFIELD).

Owing to unsuitable weather on Oct. 31st, the hydro-aeroplane contest will take place on Saturday, Nov. 7th, same time and place. Members please note Nov. 28th, as announced in last week's FLIGHT.

UNAFFILIATED CLUBS.

S. Eastern Model Ae.C. (154, PECKHAM RYE, S.E.)

Nov. 8th, Blackheath, 7.30 to 10 a.m. On Saturday, Nov. 14th, at 8 p.m., a meeting will be held at the club room.



PUBLICATIONS RECEIVED.

Royal Aero Club Year-Book, 1914. The Royal Aero Club of the United Kingdom, 166, Piccadilly, W.

Aircraft in the German War. By H. Massac Buist. London: Methuen and Co., Ltd. Price 1s. net.

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